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The Scandinavian Wood Pulp Market

By Karl A. Clauson

Secretary, Ass'n. of Pulp Consumers, New York City

During the past six weeks I have visited Europe for the purpose of studying the wood pulp market and the market pulp trends. I have had an opportunity to talk with innumerable business men, bankers, and politicians, as well as with producers and consumers of market wood pulp.

The Scandinavian wood pulp market is of particular importance at this time to you because it represents the most expensive portion of your available market pulp. It represents roughly the last 36 hours of operation in the American nonintegrated mills' operating week.

In an increasingly competitive paper market it becomes financially hazardous to depend upon a high cost source of wood pulp for anything more than a very small percent of total pulp requirements. Because the domestic and Canadian supply of market pulp is not adequate to sustain full operation of our mills, the only alternative at the moment to prohibitive pulp costs appears to be curtailed operations by those mills dependent upon Scandinavian pulp.

This prospect of curtailed operations on the part of mills dependent on Scandinavian market pulp at a time when demand continues high, is not a pleasant one either for us or for our foreign suppliers because it spells trouble for both of us in the future. Let me review briefly the European pulp picture as it looks to me.

European Supply and Demand

Both the European supply of pulp and the European demand for pulp are above the 1947 level.

Supply: Norwegian production of market wood pulp continues to bog down. The government's restriction on wood prices and the shortage of woods labor remain as the chief stumbling block in the path of increased market pulp production. The estimated production and exports of pulp and paper for two pre-war years and one post-war year were reported by *Norsk Skogsindustri* as shown in Table I.

Karl A. Clauson

The 1937 figures in Table I represent the Norwegian industry's best production year. In comparing the production for 1947 with the record year, 1937, and the year 1938, it should be noted that both mechanical and sulphite pulp are considerably below prewar levels. It is estimated that of the 103,000 short tons of sulphite exported during 1947, less than 50,000 tons was paper grade pulp. The production of both sulphate pulp and paper, on the other hand, was greater last year than it was in 1938.

As the paper and board mills are operating close to capacity, any increase in the available pulp wood supply will be used to increase the mechanical and chemical pulp production for export. It is not anticipated, however, that there will be any increase this year in either the wood supplies or the paper grade pulp exports.

Sweden is expected to attain its postwar level of production during 1948. The Swedish industry's estimated exports for 1948 in short tons, compared with two pre-war and two post-war years, are as shown in Table II.

The Swedish forestry officials say that the wood supply does not permit any appreciable increase in the 1948 estimated figures during the next ten to 20 years. The gradual change from unbleached to bleached pulp both in sulphite and sulphate is expected to continue. It should be noted in connection with the foregoing figures that the tonnage for the year 1937 represents the Swedish industry's best export year.

The estimated exports for 1948 of 573,000 short tons of bleached sulphite consist of 207,000 tons of paper grade pulp and 365,000 tons of dissolving pulp.

Finland continues to show improved export figures. Comparison is made between the exports for the two post-

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This article is based upon an address made by Mr. Clauson at regional luncheon meetings of the Ass'n., of Pulp Consumers at Hotel Syracuse, Syracuse, N. Y., June 25, The Union League Club, Philadelphia, June 28; and the Roger Smith Hotel, Holyoke, Mass, June 29. Mr. Clauson will address a fourth regional meeting on the same subject at the Manchester Hotel, Middletown, Ohio, July 7.

Alkali Output Cut

WASHINGTON—Labor-management disputes in two major alkali plants and one large ammonia plant have seriously affected the alkali supply and cut production of chlorine and industrial explosives, the Department of Commerce stated on June 22.

Concurrently time, the Census Bureau released figures showing a decided drop in production of manufactured soda ash and lesser declines in caustic soda and chlorine gas.

Production of manufactured soda ash declined from a record 404,525 short tons in March to 357,752 tons in April, reflecting shutdowns at Barberton, Ohio, and Natrium, W. Va. This drop brought soda ash production below the 367,847 tons in April, 1947.

Caustic soda output dropped to 226,000 tons in April from 244,600 tons in March, an all-time high, but still topped the previous April's 204,700 tons. Chlorine gas dropped off to 126,668 tons in

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EDITOR'S NOTE: The three addresses excerpted on this and the succeeding pages present the viewpoints of a mill purchasing agent, a paper stock dealer and the public relations counsel of the Waste Paper Institute on the subject of Standards and Practices. Earlier mention of this topic appeared in the March 18 and April 15 "Trends" pages of "Paper Trade Journal." Copies of the Study Committee on Waste Paper Standards and Practices first report will be published by the Waste Paper Institute as soon as possible.

Mill Attitude Toward Standards

By Harry C. Sackett
Alton Boxboard Co., Alton, Ill.

Twenty years ago our industry was in its infancy and it was then almost axiomatic that anything a mill favored was likely to be unpopular with waste paper dealers and vice versa.

But, in the last 20 years, the dealers and the paperboard mills have sort of grown up together. We have learned —many of us the hard way—that we are all pretty much in the same boat and that we are completely inter-dependent for our separate livelihoods. Let me illustrate this with a few figures. In 1927, the paperboard industry produced 3,800,000 tons of paperboard and consumed in that year, 2,800,000 tons of waste paper. In 1937, both industries had grown proportionately. The paperboard production tonnage had risen to 5,800,000 tons and the waste paper industry produced 3,500,000 tons.

Now let us take a look at the figures for 1947. Last year the paperboard industry produced over 9,000,000 tons of paperboard and the waste paper industry produced 7,850,000 tons of waste paper. In other words, the paperboard industry grew 138 percent in 20 years and the waste paper industry grew 180 percent. In both cases the major portion of this growth has been in the last ten years. Both industries now are almost three times as big as they were 20 years ago.

This means three things: (1) that the paperboard industry has done its part by selling the world on using paperboard products and learning to manufacture these products in a manner which will make them cheap enough for consumption in large volume; (2) that the waste paper industry has been successful in providing the right kinds of waste paper to feed this fast-growing consumer of its products; and (3) that both industries have simultaneously reached maturity at a too-rapid pace. Our industry is perhaps half a century old, a state which can rightly be called infancy when compared to other industries of similar world importance.

This rapid growth has forced us to concentrate on production—production —production. The war accelerated this pace and only within the last 12 months have we had time to do any serious thinking about the future.

All through these many years of rapid growth we have been willing to endure the frictions which we have grown up with. These frictions have been due in many cases to a misunderstanding of terms; to a lack of standards of definitions and practices of waste paper trading.

Several months ago I was asked to serve on the inter-industry Study Committee organized for the purpose of studying the possibilities of establishing some standards and practices which, if generally adopted, would enable buyers and sellers of waste paper to remove a major cause of misunderstanding and friction. I accepted this invitation because of the attitude of the Alton Boxboard Co. toward this matter.

We see the job of balerman, dealer, broker, mill buyer and inspector as identical in one important respect. These five men, all important to the job of supplying a vital raw material, have one primary duty, and that is to deliver to the mill superintendent the packing of waste paper which is required for the most economical production of a particular type of paperboard.

If you will accept this premise—that balerman, dealer, broker, mill buyer and inspector are simply links in a delivery chain, you will agree that paramount to the inter-relations of these five men, is a complete and mutually understood language of trading, as well as an accepted set of practices, for all to follow.

Using our own mill again as an example, let us investigate and see what happens when the chain is set in operation.

Let us suppose that our sales manager sells a run of board to a converter. This run is scheduled by our mill superintendent and simultaneously my department (purchasing) is informed that we will need a mixture of certain waste papers and pulps in specific proportions. So, let us suppose that the most important item of waste paper on the list is ten cars of super manila tabulating cards. Obviously, this particular grade would be difficult to get in this quantity from any one dealer.

Excerpted from an address before the Western Division of the Waste Paper Institute, Hotel Statler, Detroit, Mich., June 15, 1948.

The Value of Standards In Intra-Industry Relations

By Frank Block
Frank Block & Associates, St. Louis, Mo.

The importance of standards in intra-industry relations can best be summed up by the one word, semantics. Webster defines "semantics" as "relating to meaning or significance."

To illustrate the *world* importance of semantics, the meaning of words, I'd like to borrow a story which I heard Mr. Robert Blakely, chief editorial writer of the *Des Moines Register* tell on the subject of Russian-American relations. Mr. Blakely pointed out that in the conversations between President Roosevelt and Marshal Stalin at Teheran and Yalta, the agreements made between them were based on the meaning of words like "democracy," "social justice," "political self-determination," etc., and that these words had totally different meanings to the participants. This misunderstanding of terms unfortunately is not limited to international relations.

This same misunderstanding of meanings pervades industry. However, industry has attempted and is attempting to do something about it.

There are innumerable sets of standards in such industries as metals, iron and steel scrap, scrap rubber, cotton rags, woolen rags, bagging, mixed twines, wiping cloths and others. Each of these groups has recognized that industry-wide acceptance of the definition of commodities is basic to the smooth operation of today's rapidly-moving commodity markets. Recognition of the semantics of industrial terms is a great step forward toward the elimination of inter-industry and intra-industry misunderstandings. And so speaking as a member of the public relations profession, I would like to say that I firmly believe it is of vital importance to this industry to promulgate acceptable standards and practices, and to put them into operation.

Study of the experience of other industries points to the irrefutable conclusion that an industry reaps the full harvest of its growth only in an atmosphere of mutual confidence brought about by complete understanding.

Excerpted from an address before the Western Division of the Waste Paper Institute, Hotel Statler, Detroit, Mich., June 15, 1948.

Possible Benefits of Standards To Waste Paper Dealers

By H. C. Resnick

Acme Paper Stock Co., Louisville, Ky.

I have been interested in hearing what Frank Block and Harry Sackett have to say on waste paper standards and practices. Because, as you know, most of the adjusting to such an idea is going to be done not by public relations men and maybe not to such a great extent by purchasing agents like Harry Sackett, but by us waste paper dealers. I emphasize this at the outset because if we as an industry support the publication of a set of standards and practices, we must determine to get behind them 100 percent and this requires that we carefully measure the advantages and disadvantages to us of such a step.

Standards and practices are not new to the waste paper industry. The earliest ones on record existed in Chicago shortly after the turn of the century. It is interesting to note in this connection that these standards, primarily grade definitions, did not include definitions of corrugated, for instance, because there wasn't such a commodity traded at that time.

Since these early standards there have been several sets published and as a matter of fact, one set is in the March 1948 Blue Book which you just recently received. This set was prepared in 1934 and is of course obsolete. The important thing, the thing I want to bring out first is, that we have always had standards, but most of them have arisen through day-to-day usage and have not been formally defined.

In other words, I feel that it is safe to say that at present there are as many definitions of *No. 1 News* as there are waste paper dealers and mills in the United States.

The manifold interpretation of definitions of waste paper grades is the very thing that leads to the poor intra-industry relations about which Frank Block spoke and other serious problems which mills face in buying waste paper which Harry Sackett mentioned.

The question may arise in your mind as it did in mine—if we have had various sets of published standards in the waste paper industry from time to time, why have they not been effective? I would say that there are three important reasons for the failure of previous attempts: (1) the sets of standards and practices that have been prepared before have not been worked out in detail by a joint group of dealers and mills in an atmosphere of friendly cooperation as certainly has been the

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Excerpted from an address before the Western Division of the Waste Paper Institute, Hotel Statler, Detroit, Mich., June 15, 1948.

It is therefore natural for our department to turn to several brokers for this delivery. Let us say that each of two brokers accepts an order for five cars. Neither broker packs manila tabulating cards and he therefore calls several large dealers. For the sake of illustration, let's assume that each of the two brokers buys each a car of his manila tab cards from a different dealer. We now have ten dealers who are going to ship a car each of super manila tabulating cards to a destination unknown.

I mention the "destination unknown" aspect of waste paper trading because if the chain of delivery were simpler and the dealer knew the mill to whom he was going to ship he would probably have had previous knowledge of exactly what that particular mill meant when it said it wanted "super manila tabulating cards."

I don't want to carry this illustration to an extreme but we all know that each of the ten dealers would not originate a car of manila tab cards in his own plant. The chances are that several of them would buy from other dealers, complicating the process still further.

Now our mill understands super manila tabulating cards to be manila-colored cards, predominantly sulfite or sulfate. When we order this super grade, we expect no beater or calendar-dyed cards in excess of a very, very small amount. We do expect some tab cards with tinted margins. We also want this grade to be securely packed in bags.

Let us say that we specify the method of shipping in our purchase orders and assume that everyone defines this particular grade as we do. We are in for a surprise! The ten cars arrive and we find a tremendous variation in our purchase. Under the present circumstance, I can assure you that every dealer will have a different idea as to the definition of this grade. *There will be* colored tab cards in the shipments although Alton Boxboard's understanding of super manila tabulating cards eliminates beater and calendar-dyed cards.

Certain of the shipments will contain considerable out-throws, although our understanding is that when we pay for a super grade, out-throws should not exceed one percent and these out-throws must in no case be of the types that will damage our equipment or pollute the grade of paper we are making.

In other words, our problem as of today, with no standards, is to purchase, hoping for an acceptable shipment. If the shipment is not in accordance with our own private definition of super manila tabulating cards our only alternative is to down-grade or reject.

This is just an isolated example of one problem that arises from a lack of standards in a very special grade. This same problem exists with lower grades of waste paper to an even greater extent, because they are traded in far greater volume. The necessary "down-grade it" or "reject it" which confronts paperboard mills is too often a cause of disagreement and friction which we at the Alton Boxboard Co. feel can be largely eliminated by a fair set of acceptable standards and practices.

There is one other important benefit of standards and practices which I would like to mention. If you will review paperboard grades manufactured during the past two years, you will see a very rapid trend toward the production of better boards for more highly specialized purposes. Our company is convinced that this trend will continue. Obviously, better and more specialized paperboard demands better and more specialized waste paper in the furnish and that requires better waste paper packing by dealers.

In other words, the future of the paperboard industry is definitely in the direction of requiring better packing from better waste paper dealers.

Knowing this, it is painful to us at Alton Boxboard to see the paperboard industry encouraging poorer instead of better waste paper packing. You all know what I mean. When waste paper is not plentiful, many paper mills are so anxious to get waste paper that they accept any packing of a grade as the best packing of the grade and therefore encourage those packers who constantly produce below-standard quality. When there is plenty of waste paper, stringent buying policies are applied to all packers alike and the top-level packer is again penalized for the very thing which we at Alton Boxboard Co. are continually asking, top quality packing at all times.

This, then, is the problem and from our standpoint, we see a real solution to it in a set of standards and practices acceptable to both buyer and seller.

Summing up, let me restate the position of Alton Boxboard Co. We are interested in the idea of the publication of a fair set of standards and practices of waste paper trading because we believe that the constant us of agreed standards and practices would improve the quality of our product and reduce waste of labor and materials.

Most important, we feel sure that adherence by buyers and sellers to a set of standards and practices would remove many of the numerous frictions and misunderstandings which regularly occur in the day-to-day business of buying and selling 8,000,000 tons of waste paper annually in the United States.

HONORED BY WISCONSIN COUNCIL OF SAFETY

THE SAFETY COMMITTEE of the Kimberly-Clark Corp. Badger-Globe mill, awarded a plaque by the Wisconsin Council of Safety in recognition of outstanding achievement in accident prevention during 1947 . . . Committee members, standing, are: R. W. Wood, Andrew Hafeman, Henry Torsrud, Eugene Grode, Walter Falck, George Ziteiman, Kenneth Masterson, Jerry Otto, Al Omachinski, Leo Madison. Howard Palmer (mill manager), Gordon Schanke, and Harold Durrant. Seated are: E. V. Johnson, staff supervisor of safety; Clayton Cumings, safety committee, chairman, and E. E. Glomstead, safety director.

APA's Esgate Resigns To Become Consultant

NEW YORK—Disclosing the resignation of E. E. Esgate from the staff of the American Pulpwood Ass'n., on July 1, H. E. Brinckerhoff, executive secretary of that organization, stated to PAPER TRADE JOURNAL on June 25:

"The board of directors has accepted with regret the resignation of E. E. Esgate from the staff, effective July 1, 1948. As logging engineer Mr. Esgate was responsible for the direction of the mechanization program. This activity will continue under the direction of a replacement on the staff, to be announced.

"We are informed that Mr. Esgate's services will be available to members of the industry as a consultant on equipment and operational problems, and that his address will be 12 East Forty-First Street, New York 17. His telephone number will be LExington 2-5440."

Lily Tulip Planning Capital Realignment

WASHINGTON—Lily Tulip Cup Co., on June 21 filed proxy material with the SEC, setting a special meeting of stockholders for July 27. Purpose of meeting is to consider increasing holdings from 255,000 npv common stock to 30,000 shares of $100 preferred and 500,000 shares of npv common; also to increase number of directors.

Northwest Floods May Cut Paper and Board Production

WASHINGTON—Floods in the Pacific Northwest may cut paper and board production in that area, the Commerce Department warned on June 23. Indication of the possible drop came as the department released figures for the first four months of 1948 which show peak seasonal levels in this type of production.

Total domestic production of wood pulp, for own use and market sale, during the first four months of 1948, showed a gain of 260,000 tons or nearly seven percent more than during the same period in 1947.

Mexico Becoming Self-Sufficient Paperwise

MEXICO CITY—United States Ambassador Walter Thurston, speaking at the sumer meeting of the American Institute of Electrical Engineers here on June 25 denied charges by the local leftist press that American "economic imperialism" was involved in the world-wide newsprint shortage.

A report to the convention on the growth of the paper manufacturing industry in Mexico indicated that 1946 production would be doubled in 1949 and that thereafter the country would be able to produce almost all it consumes. Mexican paper consumption was estimated at 200,000 tons yearly.

Jose de la Macorra, manager of the San Rafael Paper Co., predicted discontinuance of most of Mexico's paper imports by next year.

Paper and Printing Dividends Up

WASHINGTON — Publicly reported cash dividend payments by United States corporations in the paper and printing industries amounted to $4,900,000 in May compared to $4,100,000 a year earlier, the Office of Business Economics of the Commerce Department reported on June 24. The payments were not separated as between paper and printing.

Trade Association Industrial Research

WASHINGTON—The Department of Commerce on June 28 issued a study showing methods of leading trade and manufacturing associations used in technical and scientific research.

The survey, "Trade Association Industrial Research," describes financing of research by such organizations, how technical committees are selected, and projects determined, how research programs are coordinated and supervised, and many other phases of such activity.

Some 80 associations cooperated in preparation of the booklet, which is 64 pages, and is for sale by the Department of Commerce at 25 cents a copy.

Alkali Licenses Eased

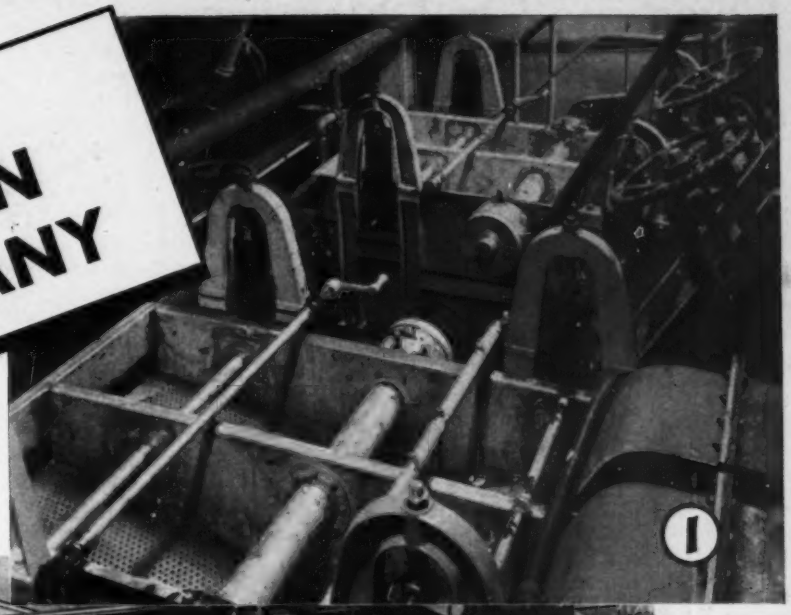
WASHINGTON—Office of International Trade stated on June 21 that caustic soda and soda ash may be exported under the BLT (blanket) export license procedure.

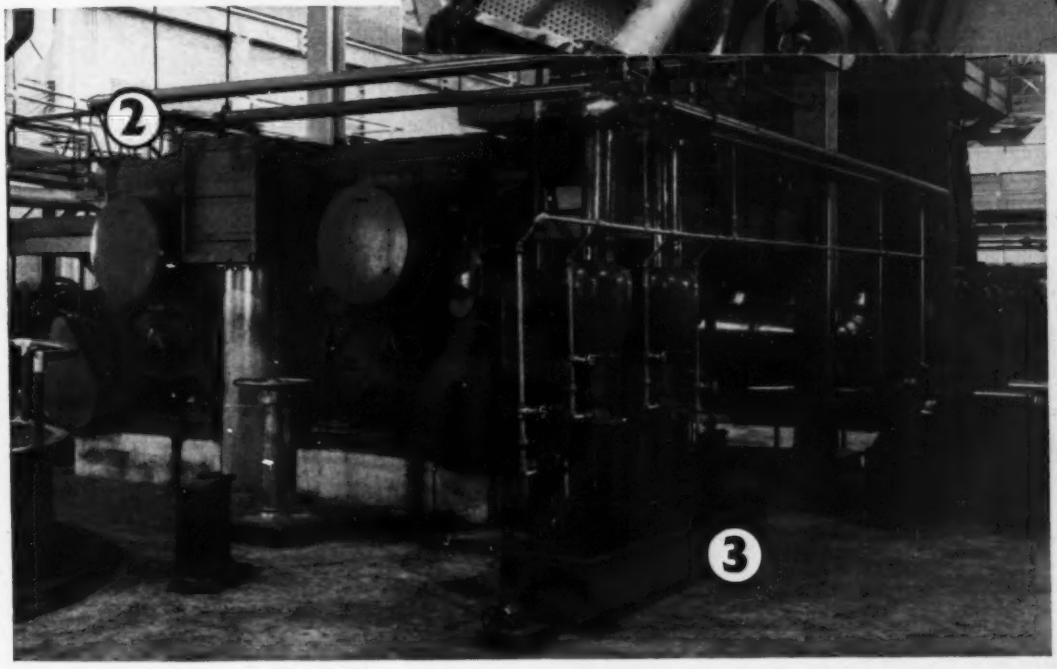
Under this procedure, an exporter can ship a positive list item on one license to two or more consignees located in a single country. The action, announced in current Export Bulletin 462, was effective immediately.

Cellophane Prices To Rise Effective August First

WILMINGTON, Del.—A six and one-half percent price boost on cellophane, effective August 1, was announced by E. I. du Pont de Nemours & Co., on June 25. The company attributed the increase to "greatly increased costs of raw materials and labor."

AT BROWN COMPANY





1 **These BIRD JONSSON SCREENS** are installed in the new sulphate pulp mill ahead of the brown stock washers. They keep the stock free of knots that would otherwise tend to break the vacuum on the washers. Washing efficiency is tremendously increased. Maximum black liquor recovery is assured.

Jonsson Screens are proving ideal for this application as well as for knotting all kinds of pulp. High capacity, insignificant loss of fibre in the tailings, low power cost and ability to handle relatively high consistencies are outstanding advantages of Jonsson screening.

2 **These BIRD SCREENS** are playing a vital part in Brown Company's modernization program by delivering clean, uniform, well individualized fibres up to the maximum capacity of the new 196-inch, 1200 ft per min. paper machine.

Big modern Bird Screens are identified with virtually every such paper production program the world over. 85% of all the paper made in North America passes through Bird Screens.

3 **and note the DIRTEC TAILINGS UNITS** in the center foreground of the picture. Dirtecs for Bird Screen tailings have become standard practice on all new installations and are replacing auxiliary screens on many existing screen installations. They assure greater dirt removal efficiency with almost no fibre loss.

BIRD
MACHINE COMPANY
South Walpole, Massachusetts

Overtime-On-Overtime

NEW YORK—A great many companies in the paper industry are at a loss as to payment of wages due to their employes who work over 40 hours per week, because of the recent Supreme Court decision on what constitutes a regular rate of pay, E. W. Tinker, of the American Paper & Pulp Ass'n., said on June 25.

Mr. McComb, Administrator of the Wage and Hour Division of the Department of Labor, has announced that employers who have treated premium pay for Saturdays, Sundays, and like periods as overtime and relied on the Administrator's rulings in good faith, will not, in most cases, be liable for back payments, since the Portal-to-Portal Act gives them ample protection," Mr. Tinker pointed out.

"But, Mr. McComb goes on to say that starting September 15, paragraphs 69 and 70 of Interpretative Bulletin No. 4, no longer will be in effect. These paragraphs said in substance, that premium pay for certain days as such could be treated as overtime and credited against accrued weekly overtime. This, the Administrator says, can no longer be followed because of the Court's decision. This decision is neither specific nor clear.

"In the paper industry there are a great many variations in the wording of employee contracts and policies. It is felt that because of the general understanding of these contracts, no one can suggest the possibility that employers or unions have misinterpreted the intent of such agreements.

"Now the Court says in effect, that regardless of collective bargaining agreements, extra compensation for Saturday and Sunday and holiday work, or work outside the regular working hours, can no longer be credited against weekly overtime. Just how far-reaching this ruling will be or what its ultimate effect will be is not known at this time.

"It is known that the Department of Justice, the Army, Navy and Maritime Commission are pressing for a review of the case, and it is also indicated by the Wage and Hour Division that the Administrator will come out with a new directive shortly. Attorneys for the Employers, and Longshoremens' Union, question the propriety of such a directive since the Supreme Court instructed the Lower Court to arrive at a basis for figuring the rate of pay, which has not been done as of this date. However, until further information is forthcoming from the Wage and Hour Administrator, it is not possible to inform the industry as to the procedure after July 1, but it is quite probable information will be at hand shortly."

Service Pins For 143 National Paper Products Men

CARTHAGE, N. Y.—One hundred and forty-three employes of the National Paper Products Division of the Crown Zellerbach Corp. received service pins from J. E. Hanny, corporation vice-president, at the firm's annual banquet June 23 at the Carlowden Country Club.

Leading the list of veteran papermakers who received pins for their years of continuous service to the concern was Fred Bingle, the only man to be awarded a 40-year pin. Thirty-five year pins went to three National Paper employes: Fred Miller, Emory Persha and Roswell Prievo.

Raymond J. Schadt, resident manager of the National Paper Plant, acted as toastmaster at the banquet and introduced the guests at the speakers' table, as well as two officials of the company, Wayne A. Brown, eastern divisional manager, and John Frost, general sales manager and former Carthage resident.

The Crown Zellerbach vice president reviewed the postwar expansion program of the corporation and expressed his assurance to the Carthage employes of the security offered by the firm, stressing the need for continued labor cooperation in the future expansion of the organization.

Johns Manville Corp., Holds Open House at Natchez

NATCHEZ, Miss. — Johns - Manville Corp., on June 25 held open house at its new insulating board plant, for Mississippi public officials, business leaders, editors, and writers. The group was shown operations in progress, and acquainted with the processes employed to turn Mississippi short leaf pine and hard wood into insulating board. D. R. Seip, plant manager was host to the visitors.

Located on St. Catherine's Creek just southeast of Natchez, the plant comprises three major buildings joined together, and 24 minor buildings. The layout occupies 400,000 square feet of a 250-acre site.

When in full operation the plant is expected to turn out approximately 200,000,000 square feet of insulating board a year.

Raw material used consist largely of pulpwood processed on the spot from short leaf pine and hard woods. Purchase of timber by Johns-Manville will provide a continuing and permanent cash crop for farmers and timber owners in Southwest Mississippi.

Mahler Terms Industry Condition "Spotty"

KIMBERLY, Wis.—Ernst Mahler, executive vice-president of the Kimberly-Clark Corp., discussed the paper industry in a talk before the Kimberly Mill Foremen's club at a dinner meeting June 21. The picture in the industry as a whole is spotty, he declared. Mr. Mahler said that emphasis will be on quality hereafter, and urged the foremen to do their best to make a clean, high-quality sheet.

J. T. Doerfler, mill manager, praised the wood room and sulphite departments of the mill for their safety records, the former having completed one year and the latter 600 days without a lost-time accident. He also emphasized the value of good housekeeping in the mill, pointing out that quality is of great importance in the buyers' market now starting.

William McDonald was reelected president of the club. A resolution to change the club name to Kimberly Atlas Management Club was presented and will come up for a vote at the meeting in August.

NEPCO Locker Paper And Meat Interleaver

PORT EDWARDS, Wis.—Nekoosa-Edwards Paper Co. began sending out shipments of its new Nepco waxed locker paper and Nepco meat interleaver late in June. The company has pioneered in this field.

The new paper is waved - one - side paper coated with an improved blend of waxes designed to maintain pliability and other desirable characteristics through a broad range of temperatures.

The Nepco meat interleaver is designed for use in preparing trays of steaks and other cuts of meats for display in the meat case. It is treated to make it impervious to blood and meat juices and at the same time retains a high degree of porosity to enable the meats to "breathe."

Strathmore Names Volanakis Technical Paper Sales Manager

WEST SPRINGFIELD, Mass. — The Strathmore Paper Co., has named Peter G. Volanakis manager of technical Paper sales succeeding the late Walton M. Blackford.

A native of Springfield, Mass., Mr. Volanakis attended the West Springfield schools and graduated from M.I.T. in 1942. Following graduation he entered the Army and served for four years. At the time of his separation he held the rank of Captain in the Chemical Warfare Service.

He became chemist at Strathmore's Woronoco mills following his release from Army duty in the spring of 1946. In October 1947 he was appointed acting manager of technical paper sales and held that position until his present appointment.

Men Buying More Greeting Cards

NEW YORK — Men today are buying 35 percent of the greeting cards sold, as against 20 percent before the war, Stephen Q. Shannon, managing director of the National Ass'n. of Greeting Card Publishers, said on June 23. Present indications point to as good a Christmas demand in 1948 as the industry has ever had, Mr. Shannon disclosed.

Take a look at your toughest competitors...

CHLORINATION CAN HELP YOU LICK THEM

You can't see your toughest competitors, bacteria, except through a microscope. However, no microscope is needed to see the damage they do in producing slime, odors, off-color stock, or poor sizing. These organisms hit fast and hard throughout your mill by infecting both your fresh and white water, and by causing heavy slime in such spots as screens, vats, head boxes and piping.

To overcome this slime formation and get *complete* protection, mills across the country are turning to Break-Point Chlorination engineered by W&T. Used either singly on your fresh water supply or in conjunction with chloramines and other corrective chemicals for stock or white water treatment, Break-Point Chlorination eliminates slime spots, slime films on fibers, pin holes, odors, and many other similar troubles.

W&T with over thirty years' experience on thousands of installations, conducts a thorough survey of each requirement before making specific recommendations. You can thus be sure that the Break-Point Process will be carefully fitted to meet your own particular needs. Write today.

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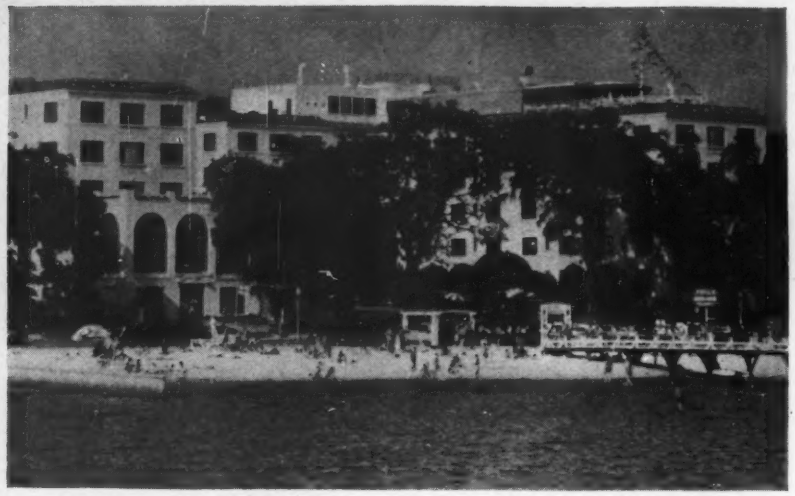


SOUTHERN PTA TO MEET IN BILOXI

SOUTHERN PAPER TRADE ASS'N. will hold its 25th Annual Convention at the Buena Vista Hotel, Biloxi, Miss., pictured above, September 23-25 . . . This is the second time this group has met there . . . Record attendance is expected because the dates permit combining a late-summer vacation with three days of good fellowship and good ideas for improving business. Delegates may bring their families along to enjoy the beach and recreational activities while they attend the business sessions of the convention . . . Entertainment will include a Gulf cruise, cocktail parties, banquet, and dancing in the evenings on the "Deck" atop the hotel. Ladies attending will be entertained on the morning of the 24th with a bingo party.

Growing Boys Growing Trees

ATLANTA, Ga. — The pulpwood industry, through the Southern Pulpwood Conservation Ass'n., is providing, for the third consecutive year, one-week camps at which the farm youth of the South learn how to better care for and treat the trees growing on the farm. Members of the Association guarantee the expenses of all camps, and are assisted in a few instances by non-member pulpmills, the lumber industry, forestry organizations, and landowners.

The camps are administered by the State Forestry Departments, which provide the teaching staff and arrange the forestry subjects to be taught.

In camp the boys learn how to prevent and control woods fires, plant trees, make thinnings, cruise timber, and how to select a tree to be cut for the best product.

More than 600 boys will receive training this summer at Camp Grist, Ala., August 1-7; Petit Jean State Park, Ark., July 12-17; Camp O'Leno, Fla., August 1-14; Hard Labor Creek Camp, Ga., August 16-21; Camp Grant Walker, La., July 12-17; Bladen Lake State Forest, N. C., August 22-28; and Holiday Lake Camp, Va., July 26-31.

Research Fellowship Renewed By Kimberly Clark Corp.

NEENAH, Wisc. — Kimberly-Clark Corp. has renewed its research fellowships at the University of Wisconsin and Massachusetts Institute of Technology for the 1948-49 school year, H. A. Rothchild, technical director of the firm and chairman of its committee on fellowships, disclosed on June 24.

Under the fellowship agreements, funds are provided to finance the studies of graduate students in a subject of interest and value to the pulp and paper industry.

Besides Mr. Rothchild, members of the Kimberly-Clark committee on fellowships are R. W. Lyons, assistant vice-president and manager of woodlands, and W. H. Swanson, chief-of-staff.

St. Regis Subsidiaries Advance Seven Executives

NEW YORK — Arch Carswell has been named executive vice-president; and H. W. Sloan, vice-president and director; and John F. Gruber and Walter M. Neill, vice-presidents of the St. Regis Sales Corp., a subsidiary of the St. Regis Paper Co.

Directors of the Taggart Corp., also a St. Regis Paper Co. subsidiary, have elected W. R. Adams and Willard E. Hahn as vice-presidents and John E. Cowles as comptroller of that company.

Crystal Tissue Advances McMurray and King

MIDDLETOWN, Ohio.—N. Thomas McMurray has been appointed assistant sales manager of the Crystal Tissue Co., and Richard E. King has been named sales manager of converted products.

In his new capacity Mr. McMurray will assist Mr. Stanley Reed, vice-president and general sales manager, in general supervision of sales. Mr. King occupies a new position created to handle Crystal resale products in the gift wrapping and waxed paper field. Mr. King has been advertising manager of the company for several years and will continue those duties along with his new responsibilities.

Walter T. Sheldon Joins St. Joe Paper Co.

JACKSONVILLE, Fla.—Walter T. Sheldon was named general sales manager of the container division of the St. Joe Paper Co., on June 21. Mr. Sheldon will make his headquarters at the company's South Hackensack, N. J., plant.

Mr. Sheldon previously was director of corrugated container sales of the Union Bag & Paper Corp. He entered the box and board fields with the Gaylord Container Corp., in 1932, leaving that firm to join the Navy in World War II, in which he served as a lieutenant. He is a graduate of the University of Missouri and of New York University and is a member of the Packaging Engineers Ass'n.

Canadian Mill Granted Generous Tax Incentive

NEW YORK—After production in the $65 million dollar mill of the Maritime Pulp & Paper Mills Corp., at Lepreau, N. B., gets started, as reported in the June 24 issue of *Paper Trade Journal*, tax evaluation will be $500,000 (Canadian currency) for the first 15 years and $1,000,000 for the succeeding 15 years.

The mill's output will be marketed mainly in the eastern U. S., and Canada, but the mill's site on the north shore of the Bay of Fundy lies on good Trans-Atlantic and coastwise shipping routes, which may open up a big export market, W. F. Keene states.

Nekoosa Edwards Erecting Shopping Center Building

PORT EDWARDS, Wis. — Ground was broken and excavation begun late in June for construction of a shopping center building here, as a major step in the $350,000 civic improvement and beautification program sponsored in the village by the Nekoosa-Edwards Paper Co. John E. Alexander, president and general manager of Nepco, turned the first spadeful of earth.

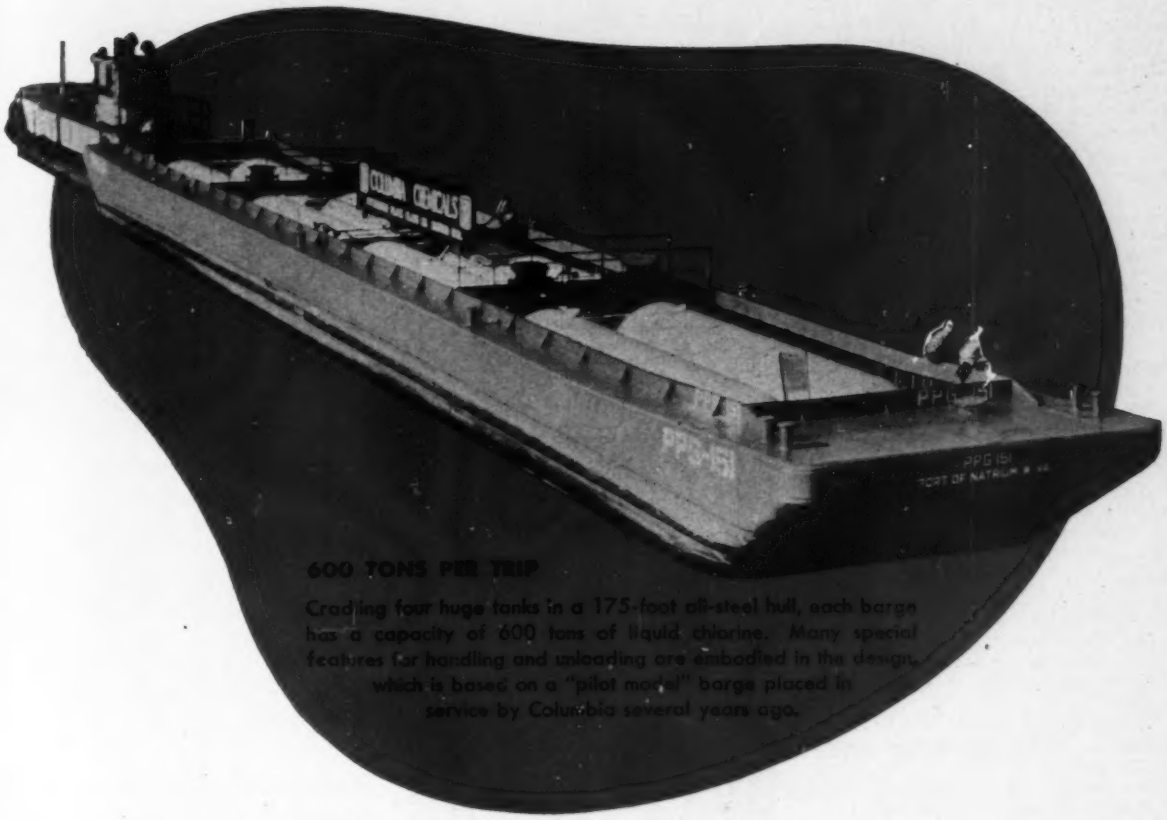
The building, which will house nine commercial and municipal units, will be 408 feet long with an average depth of 50 feet, and will be built with a concave front curved on a 1000-foot radius.

Enlarging Paper Box Plant

BINGHAMTON, N. Y.—Construction is underway in Johnson City of a $100,000 addition which will boost the Endicott-Johnson Corp., carton manufacturing capacity to 200,000 a day. The structure, a five-story addition to the Pioneer Annex factory, will provide 18,300 square feet of floor space.

Production of the carton department is now about 170,000 daily. The boxes made by the firm's carton division are used as shoe containers and for shipping purposes.

Record volumes of Chlorine shipped via waterways



600 TONS PER TRIP

Cradling four huge tanks in a 175-foot all-steel hull, each barge has a capacity of 600 tons of liquid chlorine. Many special features for handling and unloading are embodied in the design, which is based on a "pilot model" barge placed in service by Columbia several years ago.

Fleets of chlorine barges—the first ever designed specifically for this service—have been transporting record quantities of chlorine from Columbia's plant at Natrium, West Virginia . . . and from the plant of its affiliate, Southern Alkali Corporation, at Lake Charles, Louisiana. Operating along the Ohio-Mississippi inland waterways and the inland waterways system of the Gulf Coast, these chlorine barges provide obvious advantages to large-volume users of chlorine in these areas. They are among the most recent examples of the progressive service rendered by Columbia-Southern, the nation's largest merchant producers of chlorine. Pittsburgh Plate Glass Company, Columbia Chemical Division, Fifth Avenue at Bellefield, Pittsburgh 13, Pennsylvania.

COLUMBIA CHEMICALS

CHICAGO · NEW YORK · BOSTON · CINCINNATI · MINNEAPOLIS · CHARLOTTE · ST. LOUIS · CLEVELAND · SAN FRANCISCO · PITTSBURGH · PHILADELPHIA

PAINT · GLASS · CHEMICALS · BRUSHES · PLASTICS

PITTSBURGH PLATE GLASS COMPANY

Keen Naval Stores Competition

NEW YORK—Estimates for 1948-49, indicate wood rosin output will hit a new high level of 1,350,000 drums compared to gum rosin estimates of 880,000 drums.

Steam distilled wood turpentine production in 1947-48 increased 41,263 drums over the previous year's output, while gum turpentine exceeded the previous year's total by 23,742 drums.

Development of chemical research facilities by the wood naval stores industry, as against the lack of such facilities by gum naval stores producers appears to be the explanation for the rapid rise in production and consumption of wood products over gum since 1945.

Fluctuating annual expenditures of the gum industry, which vary as long term lumberland leases are matched against day-to-day market fluctuations, makes it difficult for buyers to find a sound basis for estimating their future raw material costs.

The wood industry makes long-term leases, in contracting to de-stump an area at a given future date, but costs on such operations cannot be established until the work is undertaken. The cost when eventually computed is on existing industry-wide competitive conditions at the time the de-stumping process starts.

A factor that gives wood naval stores an advantage is the normal year-round production rate that can be maintained, while gum naval stores are seasonal and production hinges on weather conditions.

A major factor alleged to be detrimental to the gum naval stores industry, is the practice of selling virgin timber to kraft manufacturers.

In addition, the gum producers have helped establish another competitive product, sulphate turpentine, by selling virgin timber to the kraft industry.

Kraft manufacturers must produce sulphate turpentine as a by-product of their processing of the pulp-wood, it was pointed out.

American Pulpwood Ass'n. statistics indicate that the Southern kraft industry is presently consuming better than 20,000 cords of lumber daily.

Dead River Dam Building Starting; Ready in 1950

BOSTON—The Central Maine Power Co. will start work on its Dead River storage station dam within the next few weeks and expects to complete it by the summer of 1950. Associated with the power company in the project are the Great Northern Paper Co. and the Hollingsworth & Whitney Co.

Wallpaper Industry Given Sales Promotion Program

ATLANTIC CITY — A promotion campaign to boost the wallpaper industry and to cost between $250,000 and $500,000 in 1949 was outlined on June 22 by Julian Brightman, advertising counselor, before the semi-annual meeting of the National Wallpaper Wholesalers Ass'n. at the Traymore Hotel.

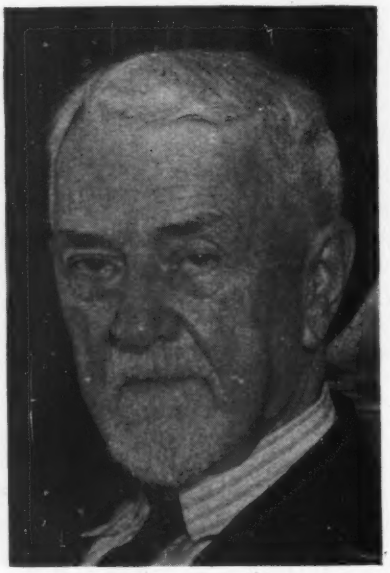
Manufacturers, retailers and wholesalers would co-operate in the plan, Mr. Brightman stressed. The theme would be based on wallpaper's value as the single most decorative and attractive home furnishing material.

Open House for K-C Force

NEENAH, Wis.—Open house was held June 24 at the Lakeview mill of the Kimberly-Clark Corp. for employes and their families to enable them to see the No. 2 creped wadding machine, which has been in operation for about a year.

About 1,200 persons attended, including 21 retired "life" members and their families. Arthur Homblette was in charge of the open house.

The machine shown to the visitors was the first of three put into operation last year by the corporation. The other two are at the new K-C mill at Memphis, Tenn. They represent the most advanced creped wadding equipment in the industry, according to J. C. Wollwage, mill manager.



CHARLES LUKENS HUSTON

pioneer steelmaker and first vice-president of H. Lukens Steel Co., Coatesville, Pa., will celebrate his 92nd birthday July 8, by working as usual, as he has done for more than the 72 years since he joined the company as a clerk in December 1875 . . . Actually, Mr. Huston's career with the company started five years earlier, in 1870 when he began to work part-time in the plant. "I wasn't much of an athlete," he recalls, "so I got my exercise by shoveling coal and doing manual chores . . . A contemporary of Andrew Carnegie, John Fritz and Charles M. Schwab, Mr. Huston played an important part in the development of America's steel industry. Mr. Huston was born in Coatesville, July 8, 1856. He began his career shortly after graduation from Haverford College in 1875 . . . He was elected vice-president of Lukens in 1897, and from 1917 to 1925 he was vice-president and works manager. In 1925 he relinquished the position of works manager but continued as first vice-president, in which position he still serves.

Congress Provides $1,800,000 Business Census Fund

WASHINGTON—An appropriation of $1,800,000 for preliminary work looking to the Business Census next year was approved in the closing hours of the recent session of Congress now in recess.

This will enable the Bureau to prepare forms and other preliminaries. Expectation here is that Congress will approve the full amount for the census when it meets next January, and the Bureau will be in a position to proceed without loss of time if this is done.

Whiting-Plover Supplying Chinese Government

STEVENS POINT, Wis. — Whiting-Plover Paper Co. has been awarded a contract to make paper for the Chinese government, according to Thomas Leech, vice president and sales manager. The paper will be engraved in China for that nation's currency. Whiting-Plover manufactured paper for Chinese currency once before—at the beginning of World War II, after Japan had taken Chinese harbors.

Greenspan and Bedford Acquire Warehouse

BROOKLYN, N. Y.—The H. B. Greenspan Co., and the Bedford Paper Products Co., Inc., 330 St. Marks Avenue, have bought a new 10,000 square foot warehouse which will be available for occupancy on August 1. The firms will continue manufacture of self-opening kraft bags, duplex coffee bags, specialties and printed bags in the present quarters, H. B. Greenspan reports.

National Container Starts Two Jordan Changeovers

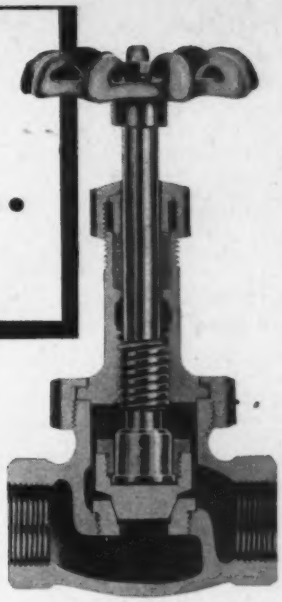
ONTONAGON, Mich. — National Container Corp. of Michigan, has just started up two Jones Majestic Jordan changeovers. In 1945 the mill purchased a Jones Majestic, and on the basis of the performance of this new machine the older units were rebuilt.

The mill manufactures kraft liner board at the rate of about 100 tons per day.

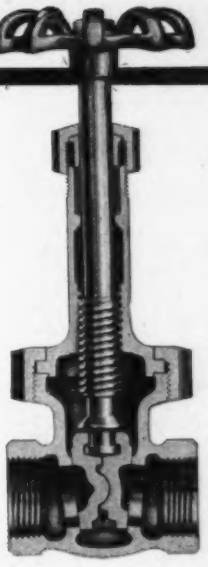
Morrilton Paper Co. New Arkansas Firm

MORRILTON, Ark.—Morrilton Paper Co., wholesale distributor of paper products, has been organized here by John B. Gordon and John Patton.

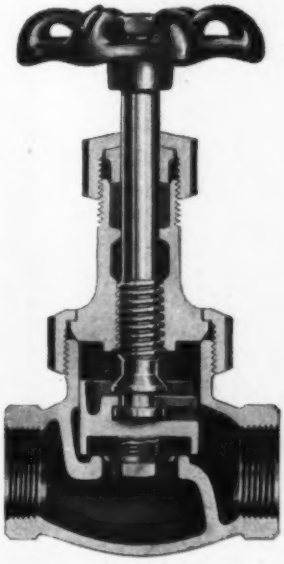
Walworth bronze valves...



Walworth No. 225P Globe Valve
500 Brinell Seat and Disc



Walworth
No. 29 Gate Valve



Walworth No. 95 Globe Valve
Re-New-Disc

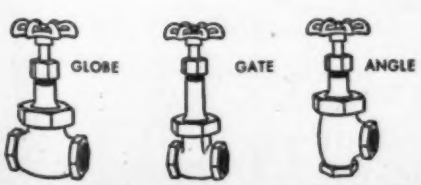
built to give dependable trouble-free service on all recommended jobs

Walworth No. 95 Bronze Globe Valves (Angle Type: No. 96) are recommended for service where throttling is not required. They are rated at 150 psi working steam pressure, 500F; 300 psi cold water, oil or gas. The improved renewable disc and lock-on, slip-off disc holder — an original Walworth development—saves time and trouble. This valve can be repacked under pressure when fully opened. All parts are designed to give maximum service and strength.

Walworth No. 29 Bronze Gate Valves are rated at 200 psi working steam pressure, 550F; 400 psi cold water, oil and gas. These valves have rising stems and integral seats. Sizes 2-inch and smaller have union bonnets; sizes 2½ and 3-inch have bolted bonnets. Valves up to and including ¾-inch have solid wedge discs; 1-inch and larger have split wedge discs. These valves can be repacked under pressure when fully opened.

Walworth No. 225P Bronze Globe Valves (Angle Type: No. 227P) are rated at 350 psi working steam pressure, 550F; and 1000 psi non-shock service on cold water, oil and gas. The stainless steel, plug type seat and disc — heat treated to 500 Brinell — can be closed on sand, slag, scale and similar floatage, without injury to the seating surfaces. They are the longest wearing, TOUGHEST bronze valves you can buy.

For full information about Walworth Quality Bronze Valves, see your Walworth distributor, or write:



WALWORTH
valves and fittings

60 EAST 42nd STREET NEW YORK 17, N. Y.

DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

Hubbs & Hastings Co. Takes Title to Premises

SYRACUSE, N. Y.—The Hubbs & Hastings Paper Co., of Syracuse and Rochester has bought the building at 339 West Jefferson street, which it had been occupying on a lease basis. Monte M. Wilkinson, vice-president and general manager, reports.

The building was previously a warehouse of the John Single Paper Co.

National's Tomahawk Corrugated Box Plant

TOMAHAWK, Wis.—The new National Container Corp., corrugated box plant adjacent to its craft paper and board mill started operating on June 28.

This additional converting plant will establish another completely intergrated operation where heretofore only paper and board were produced, Samuel Kipnis, president said.

National Gypsum Has 23 Plants, 6,000 Employes

BUFFALO, N. Y.—Thirteen employes of the National Gypsum Co. who have completed 20 years of service received watches at the annual picnic June 23 at the Automobile Club of Buffalo. Presentations were made by President Melvin H. Baker, who said the company now has 23 plants and 6,000 employes.

Mutual Boxboard Enlarges Board Machine

UTICA, N. Y.—Mutual Boxboard Co., has added two new cylinder vats and auxiliary equipment to its board machine. The machine now has eight vats, making it one of the largest in this respect. Downingtown Mfg. Co., Shartle Brothers Machine Co., and others supplied the new equipment.

AMV of World War II Elect Jonassen and Schlitt

CHICAGO—John O. Jonassen, president of the Jonassen Paper Co., was elected Commander of Greater Chicago Post No. 1, American Veterans of World War II (Amvets) on June 23 and George (Bud) Schlitt, salesman for the Bermingham & Prosser Co., was elected provost marshal.

Betner Moving to Paris, Tex. From Oklahoma City

PARIS, Tex.—The Betner Paper Bag Co. will close out its Oklahoma City plant and move the machinery in it into its new $125,000 building here, according to announcement by V. C. Ambler, manager of the company's Paris plant.

White Joins National Gypsum

BUFFALO, N. Y.—David A. White Jr. has been appointed director of public relations for the National Gypsum Co. He formerly was public relations officer for the Buffalo Regional Office of the Veterans Administration.

FRANK H. COLDWELL (left)

and

DR. HERBERT W. ROWE (right)

—recently advanced to posts of increased responsibility with the Nekoosa-Edwards Paper Co., Port Edwards, Wis. . . . Mr. Coldwell is now assistant manager of power and Dr. Rowe is assistant technical director . . . A graduate of M.I.T., Mr. Coldwell has been with NEPCO since 1925. Prior to his new appointment he was Port Edwards superintendent of power. He is active in executive and organizational capacities in the Port Edwards Boys Club, Port Edwards Boy Scouts, and is currently serving on the Port Edwards School Board . . . Dr. Rowe has served since July 1, 1947, as research director of Nekoosa-Edwards. He first became associated with the company in 1939 as a member of the technical staff. In 1940 he was assigned to work on general quality and standards. From July, 1942, until July, 1944, he served as a chemical engineer at the St. Louis Ordnance Plant. From July, 1944 to December, 1945, he was chief chemist of the Sefton Fibre Can Division of the Container Corp. of America, returning to NEPCO immediately after the completion of these duties. He is a graduate of Wabash College where he received his A. B. degree in 1936. Degrees earned at the Institute of Paper Chemistry, Appleton, Wis., include M.S. in 1938, and Ph.D. in 1940. Dr. Rowe's community activities include membership in the Port Edwards Men's Club and on the troop committee of the Port Edwards Boy Scouts of which he is general chairman.

DuPont Ups Dr. Dawson

WILMINGTON, Del.—Dr. D. H. Dawson, former sales director of the Du Pont Co., pigments department, was named assistant general manager of the department on June 24, succeeding F. H. Weismuller who will become general manager when J. F. Daley moves to the organic chemicals department as general manager on July 1.

Dr. Dawson, who lives in Wallingford, Pa., joined the Du Pont Co. in 1933 as a chemist in the Baltimore plant of the pigments department. In 1934 he was transferred to the research laboratories in Newark, N. J., where he was made assistant to the director of research. Later in the same year he returned to Baltimore to become head of the research division at the plant.

In 1940, he was transferred to the pigments laboratory at Newport, Del., where he was made supervisor of the research division and of technical service. In 1944, he was advanced to be assistant director of research on pigment colors and in 1946 was appointed director of sales.

Born September 3, 1908, in Philadelphia, Dr. Dawson was graduated from Drexel Institute of Technology in 1930, receiving his B. S. degree in chemical engineering. In the fall of that year, he entered Ohio State University as a graduate assistant and a year later became an assistant in the department of chemistry. He held a Du Pont Fellowship at Ohio during his first year there and received his Ph.D. degree from Ohio in 1933.

Innocent, Plastics Makers Reply to Anti-Trust Charges

PHILADELPHIA—Seven corporations and eight of their principal officers pleaded innocent on June 22 to indictments charging violation of the anti-trust laws in the production, distribution and pricing of certain plastic products.

U. S. District Judge J. Cullen Ganey tentatively directed that the case be listed for trial at the September term.

Defendants are: Continental Diamond Fibre Co., Newark, Del., and Norris W. Wright; Formica Insulation Co., Cincinnati, and D. J. O'Connor; Mica Insulator Co., Schnectady, N. Y., and M. A. Chapman; National Vulcanized Fibre Corp., Wilmington, and John K. Johnston; St. Regis Co., New York, and C. Russell Mahoney; Synthane Corp., Oakes, Pa., and R. R. Titus; Taylor Fibre Co., Norristown, Pa.; and L. T. McCloskey.

France, U. K., Italy Getting U. S. Carbon Black

WASHINGTON—Extensive purchases of carbon black for account of the United Kingdom, France and Italy, were authorized on June 23 by the Economic Cooperation Administration. The commodity will be purchased in this country.

Procurement authorizations included $400,000 worth for France; $2,400,000 for United Kingdom, and $285,000 for Italy.

Employes' Credit Union Pays Three Percent Dividend

NEENAH, Wis.—The credit union of Kimberly-Clark's main office declared a dividend last week of three percent for the first six months of 1948. E. H. Voigtman is president of the group.

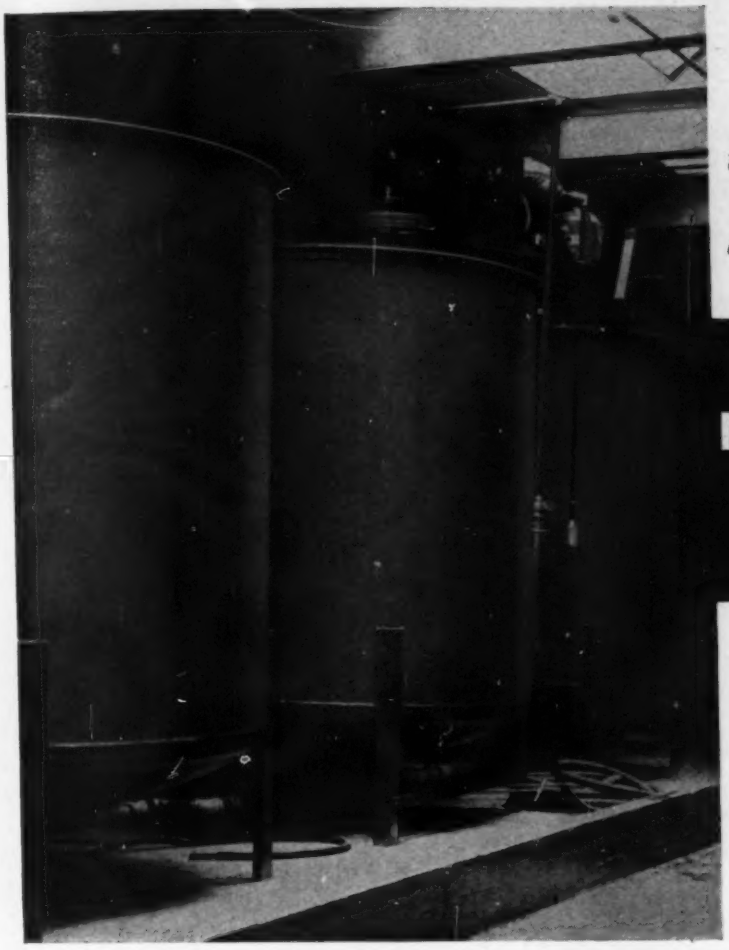
Louis Van Phelan Joins Salesmen's Association

NEW YORK—Louis Van Phelan of the Erving Paper Mills, 405 Lexington avenue, has been admitted to membership in the salesmen's Ass'n., of the Paper Industry.

United's Victory Mills Plant Closing Permanently

VICTORY, N. Y.—The Victory Mills plant of the United Board & Carton Corp. will be closed down permanently within a few weeks.

THIS PAPER COMPANY'S CHEMICAL SUPPLIER



Recommended

INCONEL-CLAD STEEL

Water-soluble phenol formaldehyde resin is handled by these tanks.

Riegel Paper Corporation of Milford, New Jersey, makers of rope, jute and glassine papers, asked the manufacturers from whom their chemicals came what material they'd suggest for these tanks. Lukens Inconel-Clad Steel was recommended and used.

The need for safeguarding these chemicals was recognized by their manufacturers and user alike. Inconel provided that protection. Lukens Inconel-Clad Steel reduced the cost of these tanks.

If your products or equipment require the protection provided by nickel, stainless steel, Inconel or Monel, it may pay you to consider using clad steels. In Lukens Nickel-Clad, Stainless-Clad, Inconel-Clad and Monel-Clad Steels, a uniform cladding of the corrosion-resistant metal is permanently bonded to a steel backing plate. Thus you get *solid* metal protection with *clad* steel economy.

Lukens offers the widest selection of clad steels available from any source—thicknesses of 3/16" and over, and as wide as 178". Claddings of 10% or 20% of total plate thickness suit most uses. For Bulletins 255 and 338, write Lukens Steel Company, 403 Lukens Building, Coatesville, Pennsylvania.

CLAD METAL STEEL

LUKENS

Nickel-Clad Stainless-Clad Inconel-Clad Monel-Clad STEELS

SOLID METAL ADVANTAGES WITH CLAD STEEL ECONOMY

• • SPEED SCRAP TO THE MILLS TO MAKE MORE STEEL • •

"OLD TIMERS" FETED BY DOWNINGTOWN MFG. CO.

FOUR Downingtown Mfg. Co. employes, each with more than 40 years of service, were recently honored at a banquet attended by approximately 60 of the firm's supervisors and foremen. These old-timers, left to right, in the photograph are: Walter Snyder, who came with the company in 1907 and is now chief draftsman; Andrew Walker, who started in 1902 and is now vice-president in charge of manufacturing; William Mercer, who began in 1904 and is now chief inspector; and Thomas Philips, who started in 1905 and is now paymaster . . . Other old-timers present were: William Walker (1881) and John Hall (1890), both retired.

Allis Chalmers Advances Arthur, Freyler and Daly

MILWAUKEE — Organization of a sixth region for the Allis-Chalmers general machinery division's field organization under William Arthur, formerly Philadelphia district office manager, has been announced by J. L. Singleton, vice- president and director of sales.

The new area, designated as the Mid-Atlantic region, with headquarters in Philadelphia, will embrace territory now covered by Philadelphia, Wilkes-Barre, Baltimore, York, Richmond and Charleston offices. The York and Charleston Offices, managed by G. E. Conn and R. L. Halsted, respectively, formerly branch offices, become district offices under the regional plan.

Mr. Arthur is succeeded as Philadelphia district office manager, a post he has held for the past 10 years, by Frank Frayler, manager of the Cincinnati district office since 1944. Mr. Freyler, in turn, is succeeded by W. F. Daly, who has been manager of the power section of the company's steam turbine department since 1943.

Philadelphia Quartz Moving To Public Ledger Bldg.

PHILADELPHIA — The Philadelphia Quartz Co., manufacturer of silicates of soda, will move its general offices from 121 South Third street, to the Public Ledger Building, Independence Square, on August 2.

This month marks completion of 117 years of business for the company which was started by Joseph Elkinton as a soap and candle manufactory on July 21, 1831.

The Philadelphia Quartz Co. name was first used in 1864 when a plant was built for producing silicate of soda. Soap and silicates continued to be manufactured until 1904, when silicates became the exlusive products of the company.

The company operates plants at Chester, Pa., Anderson, Ind., Baltimore, St. Louis, Gardenville, N. Y., Jeffersonville, Ind., Kansas City, Kans., Rahway, N. J., and Utica, Ill.

Associated companies are the Philadelphia Quartz Co. of California, with plants at Berkeley, Los Angeles, and Tacoma, and National Silicates Ltd., Toronto.

Bauer Central Region Mgr. For Allis-Chalmers

MILWAUKEE—P. F. Bauer has been named manager of a newly formed central region of Allis-Chalmers general machinery division with headquarters in Cleveland effective July 1. A native of Pittsburgh, Mr. Bauer joined the firm in July, 1928, and served as a salesman in the Pittsburgh district office until March 1, 1942, when he was named manager of the firm's industrial sales department with headquarters in Milwaukee. The new region embraces district office territories of Cleveland, Toledo, Pittsburgh, Youngstown, Cincinnati, Wheeling, Detroit, Grand Rapids and Jackson.

Goodrich Opens Science Workshop

BRECKSVILLE, O.—A multi-million dollar research center which will "make it possible to bring scientific discoveries to maturity three or four times faster than at present" was inaugurated here by the B. F. Goodrich Co. on June 15. Brecksville is a suburban community midway between Akron and Cleveland.

At the opening ceremonies, John L. Collyer, president of the company, said "the center is, we believe, the most complete industrial workshop of science now in existence." The six buildings on the 261-acre site are equipped with the latest scientific tools and equipment.

In addition to probing into the mysteries of crude and man-made rubber, BFG will conduct intensive research in such fields as chemicals, plastics, agriculture, horticulture and the application of nuclear energy to rubber manufacturing. Atomic energy's usefulness and effects in rubber and related materials will be studied in one of the center's laboratories.

Letters

Dear Mr. Heitzeberg,

I want to thank you most warmly for the splendid coverage you gave us with the article on newspaper manufacturing in Australia.

This evidence of interest in our industry by a publication with the standing of *Paper Trade Journal* is most encouraging indeed. Please also accept my thanks for your kindness in supplying me with complimentary copies of the issue containing the article, which have already been distributed among the Departments concerned in Australia. I am sure they will be very enthusiastic with the results.

E. W. EATHER,
Trade Publicity Officer
Commonwealth of Australia
New York 20, N. Y.

Heinemann Assumes Additional Duties

Gustave Heinemann, since 1934 chief chemist at the Corpus Christi, Tex. plant operated by the Southern Alkali Corp., will assume the additional duties of technical director, according to an announcement by O. N. Stevens, operating vice president of the firm.

Prior to his association with Southern Alkali, Mr. Heinemann served as a chemical engineer for four years at the Pittsburgh Plate Glass Co. alkali producing plant at Barberton, Ohio.

A native of St. Paul, Minnesota, Mr. Heinemann attended the University of Minnesota where he graduated in 1929 with the degree of B.S. in Chemical Engineering. The following year he attained his M.S. in Chemical Engineering.

He is a member of the American Chemical Society, National Assn. of Corrosion Engineers, and the South Texas Engineers Club.

Saskatchewan Minerals Beginning Operations

REGINA, Sask.—The sodium sulphate plant of Saskatchewan Minerals at Chaplin, Saskatchewan, has commenced operations.

"The initial production involved only the first of six units but we expect to achieve capacity production of 150,000 tons of salt cake per year by January of 1949," Director D. H. F. Black told *Paper Trade Journal*. "The salt cake which is being produced is of the purest quality natural salt cake available at this time. The Glauber's salts analyzes at approximately 98 percent pure. This purity results from the brining process which is used by the plant and although employed by a number of other producers it is not employed on the scale of the proportions as at Chaplin."

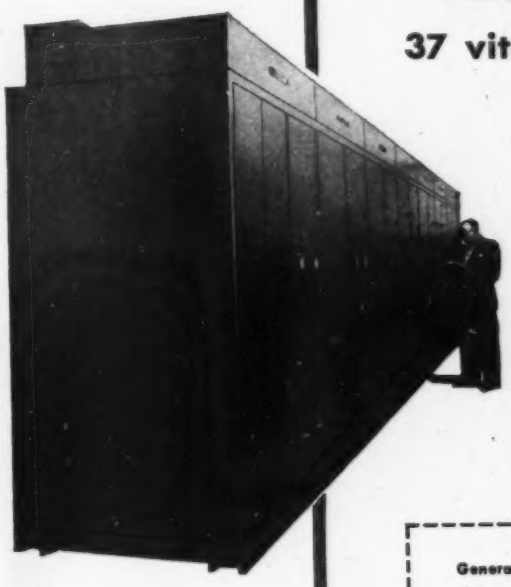
Hazel-Atlas Clarksburg Plants Operating

CLARKSBURG, Ala.—Operating in conjunction with the newly completed Hazel-Atlas Co., glass plant in this city is the Clarksburg Paper Co., which manufactures corrugated boxes.

protected...

BY GE LIMITAMP

37 vital operations in this rubber plant



Protection of this plasticator is just one of the vital jobs done by Limitamp starters at the Fisk Tire Plant of the U.S. Rubber Company at Chicopee Falls, Massachusetts. Over a period of four years, more than thirty-seven of these units have been installed in the Fisk Plant to operate generators, mills, Banburys, plasticators—and Fisk plans to add more.

"From a maintenance point of view, I wish we had Limitamp control on all our high-voltage motors." That's what P. L. Butterfield, Chief Electrician at the Fisk Plant says about these controllers.

Decreased maintenance costs are always an important consideration. Users of this equipment have found other advantages: high-interrupting capacity, increased safety, extra-long life, complete motor protection.

You'll need more information about these starters. Fill in the coupon and mail it to us. *Apparatus Department, General Electric Company, Schenectady, N. Y.*

General Electric Company, Sect. G 676-259
Apparatus Department, Schenectady 5, N. Y.

Gentlemen:
Please send me your publication GEA-4247 on the G-E Limitamp controller.

Name_____

Address_____

GENERAL ELECTRIC

TRENDS

Office of the PAPER TRADE JOURNAL
Wednesday, June 30, 1948

Heavy Chemicals

Contract prices of basic alkalis advanced 10 to 25c per hundred pounds following another round of wage increases. Proud of a record of being slowest to lift prices after the removal of OPA controls, the heavy chemical industry now must pass along its steadily mounting production costs to consumers. (For comparative wage rates, see table below.)

Hours and Gross Earnings
In Chemical Industry

	Avg. Wkly. Earnings	Avg. Wkly. Hours	Avg. Wkly. Earnings
1939 Avg.	$31.30	40.0	78.4
1941 Jan.	33.10	40.3	82.2
1947 March	55.33	41.0	135.1
1948 March	60.84	41.1	148.3

Source U. S. Dept. of Labor

With one major producer still deadlocked in a strike, and others negotiating new wage contracts, the prospect of more price changes in the fourth quarter of 1948 raised speculation. Some industry representatives who were unwilling to hazard a guess as to what the remainder of the year may bring pointed out that the facts at hand are insufficient to make a specific prediction. The feeling was that prices probably will now be stable for the rest of the year, although some minor adjustments in differentials may become necessary as a result of new union contracts.

Waste Paper

An abundant supply of low bulky grades existed in the important consuming centers as mills closed down for inventories, clean-ups and vacations. Movement of supplies to most mills was reduced to a minimum, except for pulp substitute grades and old corrugated which continued to move moderately. With a less pronounced scarcity of wood pulp, there is a lessening of demand of even these higher grades. Prices are quotably unchanged.

Reports from the Field Offices of the Dept. of Commerce show slight structural differences in the various markets. In New York City and the adjacent large cities of the Atlantic seaboard, waste paper collections in May fell off contra-seasonally, the June survey reveals, with old corrugated most affected by that trend. Dealers report stocks of folded news to be increasing, although purchases by mills for inventory include the *news* grade. "One reason for this upbuilding of dealers' stocks is the reduction of the usual *news* shipments from New York to some mills in the south in consequence of higher freight rates."

Renewed buying of substantial quantities of *news* by a former large user is expected to strengthen the prices of this grade in the Chicago market. A strengthening in the price of *mixed* in this same area is noted as a result chiefly of slackened supplies from department stores and increased demand from roofing mills. Demand for better quality *book* in the Chicago section remains dominant, with *book* grades of lesser quality subject to diminishing demand. Old corrugated is firm because of strong demand for liners.

In the northern portion of the Lake States area, collections are adequate to requirements of curtailed demand of box and carton manufacturers, the Department finds. The lower Mississippi Valley reports collections in ample volume with some mills entering the market for normal quantities after a period of inventory reduction. A seasonal drop in collections during the warmer weather in this same area may be aggravated by low prices of bulky grades, a development which may necessitate reaching out for waste paper requirements over a wide radius. Dealers in New England are said to be stockpiling all the news they can acquire, while prices of heavy books, magazines and mixed paper slumped appreciably.

The Eastern Conservation Committee estimates that mill consumption during the first six months of 1948 is approximately 2 percent more than during the same period of the record-breaking year of 1947, though per capita collections have slightly decreased.

"Waste paper collectors are still finding it profitable to collect the bulky grades," the ECC reports, "and throughout most of the metropolitan centers the peddlers last week seemed just as active as ever in going after folded newspapers and old containers."

Faced with the ever-increasing stocks of waste paper, the National Waste Paper Committee appealed to waste paper dealers throughout the U. S. to discontinue waste paper collections during the two-week period of June 25 to July 9 when consuming mills will be closed. Dealers were urged to confine collections to contract material and to reduce collections and packing operations to skeleton forces.

Commenting on the "wide-spread anticipation in the trade that a European demand for waste paper will shortly reduce our surplus of this material and result in a firming of prices," the Dept. of Commerce informs that up to the date on which the report went to press no authorization of funds for the purchase of waste paper had been effected by the E.C.A.

United States Imports of Woodpulp
(Preliminary Figures)
May 1948

Commodity	Country of Origin	(Short Ton)
Mech. ground woodpulp	Canada	26,545
Unbleached	Sweden	280
	Finland	1,008
		27,833
Screenings	Canada	428
Bleached	No Transactions	
Chemical woodpulp		
Sulphite, unbleached	Canada	41,840
	Newfoundl'd	1,101
	Sweden	16,075
	Finland	6,434
		65,450
Screenings	Canada	746
Sulphite, bleached		
Rayon and special chemical grades	Canada	19,307
	*Newfoundl'd	25
	Sweden	1,518
	Norway	28
	Finland	932
		21,810
Other	Canada	22,612
	Sweden	1,434
	Norway	798
	Finland	3,920
		28,920
Sulphate	Canada	13,626
Unbleached	Mexico	463
(Kraft Pulp)	Sweden	6,539
	Finland	10,818
		31,446
Bleached	Canada	17,449
	Sweden	9,640
		27,089
Soda pulp, unbleached and bleached	Canada	1,795

* Being investigated

Indices

Index of general business activity for the week ended June 19 dipped to 149.2 from 151.3 in the preceding week, compared with 144.7 for the corresponding week of 1947.

Index of paperboard production dropped to 183.0 from 197.4 in the preceding week, compared with 183.7 in the corresponding week of 1947.

Comparative indices for paper and paper board production as reported by AP&PA are shown below:

	June 19 1948	June 12 1948	June 21 1947	June 22 1946	June 23 1945
Paper*	95.3	95.0	106.1	106.2	90.4
Paperboard ..	97.0	101.0	102.0	97 0	96.0

* Tonnage production was 1.8 percent greater than last year's although because of a 13.3 percent increase in 1948 capacity this year's production ratio is lower.

Paperboard Production Statistics

	For Weeks Ended June 19 1948	June 12 1938	June 21 1947
Production	182,205	193,156	182,909
New Orders ...	173,264	171,337	166,639
Unfilled Orders.	369,348	380,421	487,877

Percent of Activity—Current....97%.
Percent of Activity—Year to Date....101%.

PERKINS
HOLYOKE
1873-1948
No calender can be better than the Rolls in it.
B. F. PERKINS & SON, Inc.
HOLYOKE, MASS., U.S.A.
LARGEST MANUFACTURERS OF CALENDER ROLLS IN THE WORLD

IMPORTS

Week Ending June 26

NEW YORK

Newsprint

H. G. Craig Co., Donpaco, 347 rolls.
Pagel Horton & Co. Inc., Stavangerfjord, Oslo, 84 rolls.
Madden Reeve Angel & Co., Mormacisle, Helsingfors, 628 rolls.
R. A. Olsen, Newscarrier, Donnacona, 377 rolls.
N. Y. Journal American, Markland, Liverpool, N.S., 510 rolls.
N. Y. Herald Tribune, Markland, Liverpool, N.S., 1744 rolls.
N. Y. World Telegram, Markland, Liverpool, N.S., 441 rolls.
Brooklyn Eagle, Markland, Liverpool, N.S., 701 rolls.
Price & Pierce, Ltd., Markland, Liverpool, N.S., 187 rolls.
Washington Post, (Alexandria, Va.), Markland, Liverpool, N.S., 2694 rolls.
Alexandria Gazette, (Alexandria, Va.), Markland, Liverpool, N.S., 33 rolls.
Washington Daily News, (Alexandria, Va.), Markland, Liverpool, N.S. 337 rolls.
The Sun, (Alexandria, Va.), Markland, Liverpool, N.S., 30 rolls.
Daily Mirror, Ethel Tombs, Gatineau, 370 rolls.
R. A. Olsen, A.C.D., Donnacona, 373 rolls.
Aqua Shipping Co., G.T.D., Donnacona, 353 rolls.
R. A. Olsen, G.D.D., Donnacona, 379 rolls.

Basic Paper

Haloid Co., American Planter, Bremen, 1 cs.

Wallpaper

Intramar Shipping Co., American Planter, Havre, 1 cs.
Gerhard & Hey, Mormacisle, Stockholm, 1 pcl.

Photo Paper

Lep Transport Inc., American Banker, London, 97 drums. (base).

Paperhangings

Matthias Paper Corp., American Banker, London, 3 bls.

Drawing Paper

Green Kriegsman Paper Corp., America, Southampton, 5 cs.

Wrapping Paper

Stevens Nelson Paper Corp., Pres. Tyler, Genoa, 13 cs.

Tissue Paper

B. F. Drakenfeld & Co., Parthia, Liverpool, 15 cs.

Cardboard

Zanadu Manufacturing Corp., De Grasse, Havre, 12 cs.

Rice Paper

Eurasia Import Co., Sally Maersk, Keelung, 1 cs.

Tracing Cloth

E. Dietzgen & Co., Parthia, Liverpool, 6 bls. (bleached cotton).

Gummed Paper

B. F. Drakenfeld & Co., Parthia, Liverpool, 36 cs.

Crepe Paper

(———), Parthia, Liverpool, 8 crates.

Kraft Paper

Castle & Overton, Inc., Stavangerfjord, Oslo, 277 rolls.

Rags, Baggings, Etc.

Darmstadt Scott & Courtney, Express, Calcutta, 100 bls. new hessian cuttings.
C. Comiter, Pioneer Wave, Shanghai, 200 bls. cotton waste.
Railway Supply & Manufacturing Co., Uruguay, Rio Janiero, 153 bls. cotton waste.
J. Stein, Uruguay, Buenos Aires, 38 bls. paperstock.
E. J. Keller Co. Inc., Elizabeth Bakke, Haifa, 81 bls. paperstock.
Irving Trust Co., Elizabeth Bakke, Naples, 489 bls. light hessian bagging.
A. de Vries, Jessie Maersk, Rouen, 42 bls. rags.
H. Adlerstein, Pres. Tyler, Genoa, 96 bls. old jute rags.
Connecticut Burlap & Waste Co., Mawarri, Calcutta, 6 bls. old jute rags.
Chase National Bank, American Attorney, Antwerp, 140 bls. old waste bagging.
National City Bank, American Attorney, Antwerp, 70 bls. jute bagging.
Chemical National Bank Trust Co., American Attorney, Antwerp, 120 bls. jute bagging.
(———), Parthia, Liverpool, 27 bls. new wool rags, 41 bls. wool thread waste.
J. J. Rozendaal, Stavelot, Antwerp, 109 bls. cotton waste.
J. H. Schroeder Banking Corp., Stavelot, Antwerp, 129 bls. cotton waste.
Irving Trust Co., Stavelot, Antwerp, 60 bls. bagging.

Old Rope

P. J. Schweitzer, Forest, Calcutta, 74 bls. old hemp rope cuttings.
R. L. Pritchard, Forest, Calcutta, 176 bls. old hemp rope cuttings.
R. L. Pritchard, Marwarri, Calcutta, 130 bls. old hemp rope cuttings.
W. F. Malcolm Co., Marwarri, Calcutta, 60 bls. old hemp rope cuttings.

Casein

J. H. Schroeder Banking Corp., Westralia, Buenos Aires, 400 bags.
Casein Co. of America, Div. The Borden Co., Mormacdawn, Buenos Aires, 1000 bags (ground lactic).
American Cyanamid Co., Mormacdawn, Buenos Aires, 1000 bags.
Borden Co., Chemical Div., Mormacdawn, Buenos Aires, 700 bags (ground lactic).

Gluestock, Etc.

(———), Sally Maersk, Hong Kong, 150 bls. gluestock.
Karr Ellis, Parthia, Liverpool, 252 bags dry hidecuttings.

Woodpulp

Price & Pierce, Ltd., Markland, Liverpool, N.S., 2498 bls. unbleached sulphite pulp.
The Borregaard Co., Stavangerfjord, Oslo, 150 bls. dry bleached sulphite pulp.

Woodpulp Boards

Jay Madden Corp., Mormacisle, Helsingfors, 401 rolls; 95 bls., 121 rolls (solid white).

BOSTON IMPORTS

Paul A. Dunkel, Bowhill, Buenos Aires, 1000 bags casein.

PHILADELPHIA IMPORTS

Madden Reeve Angel & Co. Inc., Mormacisle, Helsingfors, 403 rolls newsprint.
National Casein Sales Co., Westralia, Buenos Aires, 2032 bags lactic casein.

Swedish Wood Pulp Exports To U. S. in 1948

The May 31 issue of the *Swedish Wood Pulp Journal* carried the following review of prospects for exports of wood pulp to the United States in 1948:

"The production of the current year has to a great extent been placed through firm contracts or through reservations of a more or less binding nature. As regards bleached sulphite, there are, of course, possibilities to vary the production between dissolving pulp and paper pulp; the sales of both these grades have proceeded quite far, and it seems likely that any quantities remaining available will find buyers without any difficulty. For unbleached paper sulphite, too, the statistical position is very firm. As to unbleached sulphate pulp it is reported that some American buyers have indicated that cancellations of current contracts may be expected unless price reductions are made. As mentioned in earlier issues of our Journal, some cancellations were made on certain contracts for the second quarter, but the goods in question were immediately placed on other markets.

"It seems likely that the shipments to the United States in 1948 will be smaller than in 1947. The future will show whether this development is of a general cyclic character or of a more or less permanent nature. The American market absorbs nowadays a comparatively smaller part of the Scandinavian pulp exports than before the war. Because of the very rapid development of the American paper industry, and especially within the section of 'self-containing mills,' the relative importance of 'converting mills' has declined. This tendency seems to be still progressing and a new equilibrium has not been reached as yet. Evidently it will be in the interests of the Scandinavian pulp exporters to benefit their American customers as far as possible, and they will certainly do their best in this respect, even if present circumstances limit their possibilities. Considering the present state of things, we are inclined to predict that wood pulp prices will remain unchanged during the near future. Should a devaluation of non-dollar currencies, expected in some quarters, be carried into effect, the question of the pulp prices will then have to be considered with due regard to the ensuing situation."

Fusion Oven Perfected

PEABODY, Mass.—Research and development on a cooperative basis between American Resinous Chemicals Corp., and Gehnrich & Gehnrich, Inc., have resulted in a practical fusion oven for use in curing Vinosol (organosol) coatings. Announcement of the oven came following several years of work on the part of chemists and engineers from the two companies.

Ames Names Sybrandt And James Distributors

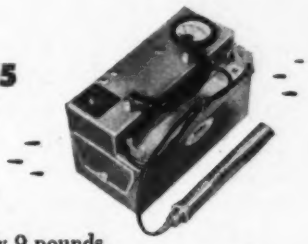
WALTON, Mass. — The B. C. Ames Co. has named the following exclusive representatives to handle its line of micrometer dial gauges and indicators: In northeastern Ohio, the Sybrandt Co., 4500 Euclid Avenue, Cleveland; and in northern California, the Allan P. James Co., 419 Tenth Street, San Francisco.

NOW...
BECKMAN RADIATION METERS

- Accurately Measure Beta, Gamma and X-Rays
- Incorporate Many Unique Advancements
- Available in a Wide Range of Types and Sizes

Beckman dependability and quality are available in a new field of instrumentation.

The Beckman organization has developed a new line of radiation meters incorporating greater accuracy and reliability, and more compactness and convenience—features which are important to all those working in the field of nucleonics.



MODEL MX-5
Geiger-Mueller Rate Meter

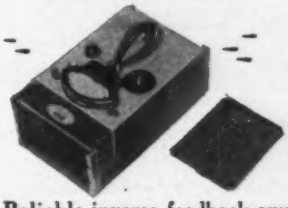
Light weight—only 9 pounds.
Completely waterproof and humidity-proof.
400 hour amplifier battery life.
Unique one-tube amplifier.
Only one operating control besides range switch.
0.2 to 20 MR/hr operating range.
Price **$250.00**

MODEL MX-4
Universal Laboratory Ionization Meter

Operating range: 1-20,000 MR/hr in 14 overlapping steps.
Interchangeable ionization chambers on extended cable to minimize secondary radiation effects.
Three-step inverse feedback amplifier for maximum response speed and reliability.
Completely portable—operates from self-contained long-life batteries.
Price **$650.00**

MODEL MX-3
A.C. Operated Beta, Gamma Monitor

Stable A.C. operated D.C. amplifier.
Only one operating control besides range switch.
Direct-reading—no calibration curves.
Operating range: 20-2,000 MR/hr in five overlapping steps.
Special circuit insures rapid response.
Price **$350.00**



MODEL MX-2
Beta, Gamma Survey Meter

Reliable inverse feedback amplifier.
Self-checking for amplifier sensitivity and battery condition.
Direct-reading—no calibration.
Only one control besides range switch.
600 hour battery life.
Operating range: 20-2,000 MR/hr in five overlapping steps.
Price **$300.00**

Descriptive Literature giving more details on Beckman Radiation Meters will gladly be sent. Write, outlining your application. *Beckman Instruments, National Technical Laboratories, South Pasadena PT-1, California.*

BECKMAN **INSTRUMENTS CONTROL MODERN INDUSTRIES**

pH Meters and Electrodes—Spectrophotometers—Radiation Meters—Special Analytical Instruments

PRICES

The quotations given below are indicative of trends in an open market. At the moment they can be of little more value, for while some volume business still is being done under contract at the figures given below, fluctuations representing special conditions are too varied and too frequent to permit prices to be given as representing a wholly stabilized market.

NEW YORK

Paper

(Delivered New York)

Standard News, per ton—
Rolls, contract .... $93.00/$96.00
Sheets 108.00/109.00

Kraft—per cwt.—Carload Quantities Zone A Deld. 40 lb. base wgt.

Superstandard Wrapping ..... $9.00/ —
No. 1 Wrapping 7.25/ 8.00
Standard Wrapping .. 6.50/ —
Standard Bag ..... 6.50/ —

Tissues—Per Ream 24x36 (480) 11 lb. Zone 1.

Wh. No. 1 Frd. .... $1.84/$2.00
Wh. No. 1 M. G. ... 1.94/ 2.00
Wh. No. 1½ ..... 1.60/ —
Wh. No. 2 ..... 1.75/ —
Kraft Anti-Tar ..... 1.65/ —
Kraft Unbl. ..... 1.85/ —
Manila No. 2 ..... 1.62/ —
Shred. Wh. No. 1 cwt. 1.10/ 1.50

Toilet—Per Case of 100 rolls—1 M Sheets.

Unbleached ..... $8.50/$10.00
Bleached 8.50/ 10.00

Paper Towels—Per Case of 3750—Zone 1.

Wh. Jr. M'tif'd 9¼x9½ .. $5.15
Br. Sr. M'tif'd 10x12 ..... 3.60
Br. Jr. M'tif'd 9½x9¾ ... 3.10
Br. Jr. Sgl. fold 10x10¾ .. 3.15

Manila—per cwt.—C-l. f.a.

No. 1 Jute Tag ... $14.50/ —
Reg. Jute Manila . 13.25/$15.50
No. 1 Manila .... 9.75/ —
5 lb. Manila 10.75/ 11.25

Boards, per ton—

Plain News ..... $92.50/ —
Filled News ..... 94.00/ —
Plain Chip ..... 90.00/ —
Sgl. Mla. L-d. Chip* 100.00/102.50
White Pat. coated* 120.00/ —
Kraft Liners 42 lb. 100.00/ —
Kraft Corr. .009 .. 105.00/ —
Binders. Boards ... 126.00/ —

* Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following prices are representative of distributors' resale prices, all deliveries in Zone 1:

Rag Content Bonds and Ledgers—White, 16 lb.

Bonds, per cwt.

	Carton	4 C't'n	Ton
100% Rag Ext.			
No. 1	$55.00	$50.80	$48.70
100% Rag ...	48.25	44.55	42.70
75% Rag	37.50	34.55	33.10
50% Rag	32.25	29.40	28.25
25% Rag	28.75	26.15	25.10

Ledgers, per cwt.

100% Rag Ext.			
No. 1	$55.00	$50.80	$48.70
100% Rag ...	48.25	44.55	42.70
75% Rag	37.50	34.55	33.10
50% Rag	32.25	29.40	28.25
25% Rag	28.75	26.15	25.10

Sulphite Bonds and Ledgers—White, 16 lbs.

Bonds, per cwt.

No. 1	$21.25	$19.25	$18.50
No. 2	20.25	18.30	17.55
No. 4	19.25	17.55	16.85

Ledgers, per cwt.

No. 1	$21.75	$19.65	$18.85
No. 2	20.75	18.75	18.05
No. 4	20.00	18.10	17.35

Free Sheet Book Papers—White, Cased Paper

(Per cwt.)	Case	Ton
No. 1 Glossy Coated .	20.40	$19.50
No. 2 Glossy Coated .	19.15	18.30
No. 3 Glossy Coated .	18.40	17.60
(Per cwt.)	Case	Ton
No. 1 Antique (Watermarked)	$15.90	$15.15
No. 2 Offset	15.15 to 17.90	14.60 to 17.10
A Grade E. F.	14.90	14.25
A Grade S. & S. C. .	15.40	14.65
B Grade E. F.	13.90	13.30
B Grade S. C.	14.40	13.70

Wood Pulp

Domestic mill contract prices delievered with varying freight allowances.

	Per Short ADT
Groundwood	$80.00/$81.00
Unbleached Sulphite .	124.00/ —
Bleached Sulphite ...	125.00/135.00
Bleached Soda	130.00/ —
Bleached Sulphate ...	175.00/185.00
Unbleached Sulphate Northern	125.00/155.00
Unbleached Sulphate Southern	130.00/145.00

Canadian Quotations

Prices delivered with varying freight allowances unless otherwise specified:

	Per Short ADT
Unbleached Sulphate .	125.00/130.00
Unbleached Sulphite .	125.00/150.00
Bleached Sulphite ...	125.00/160.00
Glassine Unbleached Sulphite (no freight allowance)	120.00/ —
Bleached Soda	130.00/ —
Groundwood	80.00/ 85.00
Sideruns Pulping News	80.00/ 90.00
Hardwood and Specialty Grades	Nominal

Swedish Quotations

On dock, Atlantic Ports

Bleached Kraft	185.00/ —
Bleached Sulphite ...	185.00/ —
Unbleached Sulphite .	155.00/157.50
Unbleached Kraft ...	147.50/ —

Finnish Quotations

On dock, Atlantic Ports

	Per Short ADT
Bleached Sulphite ...	$187.50/ —
Unbleached Sulphite .	155.00/157.00
Unbleached Sulphate	147.50/ —

New Domestic Cotton Cuttings

(F.O.B. Shipping Point Plus Dealer's Commision)

White Shirt	$11.50/$12.00
Unbleached Muslin ...	12.00/ 12.50
Light Silesias	9.00/ 9.25
White Back Blue Overalls	9.00/ 9.50
Blue Overalls	8.00/ 8.25
Fancy Shirt	6.00/ 6.25
Light Percales	8.50/ 8.75
Light Prints	7.50/ 7.75
No. 1 Washables	5.00/ 5.25
Bleachable Khaki	7.50/ 8.00
Unbleachable Khaki ..	6.50/ 7.00
Cottonades	5.50/ 5.75

Old Domestic Cotton Rags

(F.O.B. Shipping Point Plus Dealer's Commission)

	Per 100 lbs.
No. 1 Whites Repacked	$5.50/ $6.00
No. 1 Whites Miscellaneous	4.50/ 5.00
No. 2 Whites Repacked	3.50/ 3.75
No. 2 Whites Miscellaneous	3.00/ 3.50
Blue Overalls	3.75/ 4.00
Thirds and Blues Repacked	3.25/ 3.50
No. 1 Roofing Rags ..	1.70/ 1.80
No. 2 Roofing Rags ..	1.60/ 1.70
No. 3 Jute Bagging ..	1.50/ 1.60
No. 4 Brussels and hard back carpets ..	1.50/ 1.60
No. 5A Roofing Rags .	1.50/ 1.60

New Foreign Cotton Cuttings

(Prices to Mill, F.O.B. Dock, N.Y.)

	Per 100 lbs.
New Dark Cuttings ..	$5.50/ $5.75
New Mixed Cuttings ..	6.25/ 6.50
Light Silesias	9.25/ 9.50
Light Flannelettes	9.25/ 9.50
New White Cuttings ..	12.00/ 13.00
New Unbleached Cuttings	12.25/ 13.00
Fancy Shirt Cuttings .	6.50/ 7.00
Light Prints	7.75/ 8.00
Bleachable Khaki, No. 1	7.00/ 7.50
Unbl. Khaki, No. 1 ..	6.25/ 6.75

Old Foreign Rags

(Prices to Mill, f.o.b. dock, N.Y.)

	Per 100 lbs.
No. 1 White Linens ..	$14.00/$16.00
No. 2 White Linens ..	12.00/ 13.00
No. 3 White Linens ..	8.00/ 9.00
No. 4 White Linens ..	8.00/ 9.00
No. 1 White Cottons ..	8.00/ 10.00
No. 2 White Cottons ..	7.00/ 8.00
No. 3 White Cottons ..	6.00/ 6.50
No. 4 White Cottons ..	4.00/ 4.50
Extra Light Prints ...	6.50/ 7.00
Old Light Prints	4.50/ 5.00
Med. Light Prints	4.00/ 4.50
Dutch Blue Cottons ...	5.25/ 5.50
Checks and Blues .. .	4.00/ 4.25
Linsey Garments	2.35/ 2.50
Dark Cottons, European	2.30/ 2.35
Dark Cottons, Egyptian	3.25/ 3.50
Old Shopperies	2.20/ 2.30
New Shopperies	2.25/ 2.30

Bagging

(Prices to Mill, f.o.b. N.Y.)

	Per 100 lbs.
Foreign Gunny, No. 1	$6.75/ $7.25
Domestic Gunny, No. 1	6.75/ 7.25
Heavy Wool Tares ...	6.25/ 6.50
No. 1 Scrap Bagging ..	5.50/ 5.75
Roofing Bagging	1.50/ 1.75
Foreign Manila Rope ..	6.00/ 6.75
Domestic Manila Rope	6.50/ 6.75
Jute Strings	5.00/ 5.25
No. 1 Sisal Strings ..	5.25/ 5.50
Mixed Strings	1.75/ 2.50

Waste Paper

Base Prices to Mills for Average Packings

(Dollars Per Ton)

F.o.b. New York, Baled

No. 1 Hard White Envelope Cuts, one cut	$155.00/$165.00
No. 1 Hard White Envelope Cuts ..	145.00/ 155.00
No. 1 Hard White Shavings, unruled	140.00/ 150.00
No. 1 Hard White Shavings, ruled ..	110.00/ 130.00
Soft White Shavings, one cut	140.00/ 150.00
No. 1 Sott White Shavings	125.00/ 135.00
Soft White Shavings, Misc.	115.00/ 125.00
No. 1 Fly Leaf Shavings	45.00/ —
No. 1 Groundwood Fly Leaf Shavings ...	35.00/ —
N. 1 Heavy Books & Magazines	25.00/ 26.00
Mixed Books	15.00/ 18.00
No. 1 White Ledger	75.00/ 80.00
Col. Ledger	55.00/ 60.00
Manila Tab. Cards .	95.00/ 100.00
New Manila Envelope Cuttings, one cut .	100.00/ 110.00
New Manila Envelope Cuttings	65.00/ 75.00
Extra Manilas	25.00/ 30.00
Mixed Kraft, Env. & Rag Cuttings	75.00/ 85.00
Kraft Envelope Cuttings	100.00/ 110.00
Triple Sorted, No. 1 Brown Soft Kraft	65.00/ 75.00
New Kraft Corrugated Cuttings ...	70.00/ 75.00
No. 1 Assorted Old Kraft	50.00/ 55.00
New Jute Corrugated Cuttings	27.00/ —
Old 100% Kraft Corrugated Containers	35.00/ 40.00
Old Corrugated	23.00/ 25.00
No. 1 News	11.00/ 12.00
No. 1 Mixed Papers.	9.00/ 10.00
Box Board Cuttings..	8.00/ 9.00
White Blank News .	75.00/ 85.00
Overissue News	16.00/ 17.00
Mill Wrappers	22.00/ 24.00

Twines

All Prices Nominal, F.o.b. Mill

(Soft Fiber)

Coarse Polished—India	.34½/ .35¾
Fine Polished Fine India	.41¼/ .45
Unpolished—	
Paper Makers ...	.31 / .33½
Tube Rope	.29¾/ .32¼
Wrapping	.32¾/ .36½
Cotton	.63¾/ .66¾

(Hard Fiber)

Mex. Sisal	.21 / .27
Manila (Reprocessed)	.30 / .32

(American Hemp)

Polished Hemp	.36¾/ .60
Unpolished	.32¾/ .54

PHILADELPHIA

Domestic Rags (New)

(F.O.B. Eastern Shipping Point)

Shirt Cuttings—	
New White No. 1	.11 / .12
New White No. 2	nominal
Light Silesias	.07½/ .08
Black Silesias, soft	.06½/ .07
New Unbleached ..	.10½/ .11¼
Washable Prints .	.06½/ .07
Washable No. 1 ..	.05 / .05½
Blue Overall	.07½/ .08
Cottons—According to grade—	
Washable Shredding	.03½/ .04
Fancy Percales ..	.06¾/ .07¼
New Black Soft ..	nominal
Khaki Cuttings—	
Unbleachable Cotton Cuttings ...	.06 / .06½
Bleachable Cotton Cuttings	.07 / .07½
Men's Corduroy ..	.05½/ .06
Ladies' Corduroy .	.05 / .05½
Cottonades	.05½/ .06

Domestic Rags (Old)

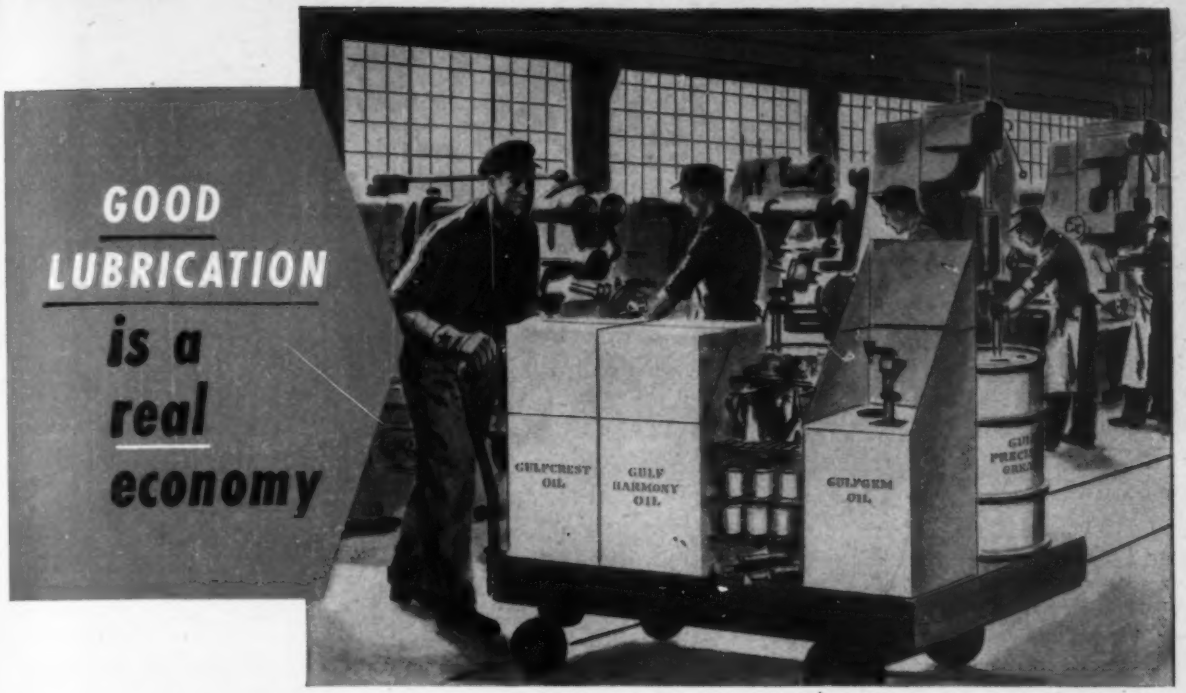
(F.O.B. Eastern Shipping Point)

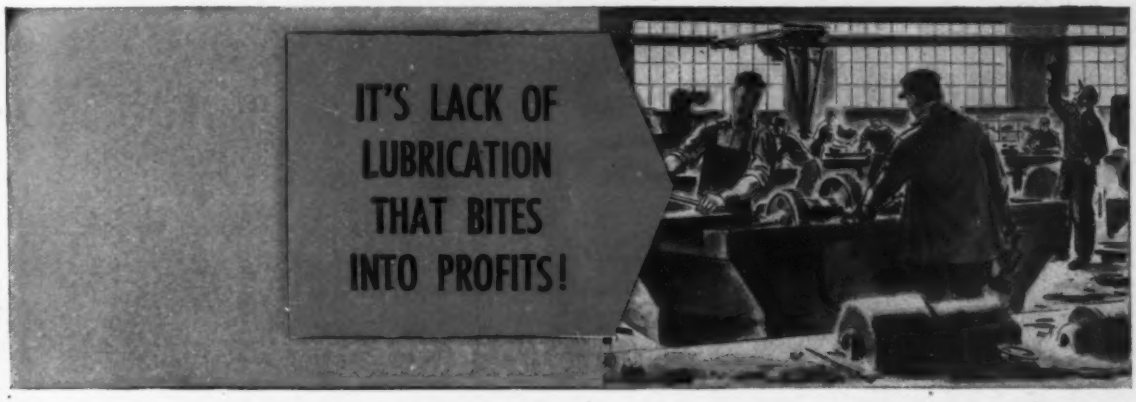
White No. 1 —Repacked	4.50 / 5.00
Mixed White	4.00 / 4.25
White No. 2—Repacked	3.50 / 3.75
Thirds and Blues—	
Miscellaneous	2.25 / 2.50
Repacked	2.75 / 3.00
Roofing Stock—	
Foreign No. 1 ..	nominal
Domestic No. 1 ..	1.85 / 1.90
Domestic No. 2 ..	1.75 / 1.80
Roofing Bagging ..	1.65 / 1.70
Old Manila Rope ..	6.25 / 6.50

Bagging

(F.O.B. Eastern Shipping Point)

Gunny No. 1—	
Foreign	nominal
Domestic	4.75 / 5.25
No. 1 Clean Bright—Sisal Strings	.04½/ .05
No. 2 Clean Bright—Sisal Strings	.03½/ .04
Sisal Jute	.02¾/ .03
Scrap—	
No. 1	5.00 / 5.50
No. 2	2.50 / 3.00





SCIENTIFIC LUBRICATION helps increase plant efficiency in two important ways: helps increase production—machines run more smoothly, more accurately, with less down time; helps reduce maintenance costs—excessive wear is eliminated and fewer repairs are necessary.

To make sure that lubrication in your plant is on a par with other vital production factors, call in a Gulf Lubrication Engineer. Discuss with him the possibility of increasing your production and lowering your costs through selection of the most suitable lubricants and the best methods of application. He will show you how scores of plants have benefited materially through this modern approach to greater efficiency.

The services of a Gulf Lubrication Engineer—and the more than 400 Gulf quality oils and greases—are quickly available to you through 1200 warehouses located in 30 states from Maine to New Mexico. Write, wire, or phone your nearest Gulf office today.

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GULF INDUSTRIAL LUBRICATION

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for quality lubricants and expert lubrication engineering service

Old Papers

(F. o. b. Phila.)
Mill Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	$100.00/	$115.00
No. 1 Hard White Shavings, unruled	100.00/	—
Soft White Shavings, One cut	90.00/	95.00
White Blank News	75.00/	—
Soft White Shavings	80.00/	—
No. 1 White Ledger	85.00/	90.00
No. 1 Heavy Books & Magazines	24.00/	26.00
Overissue Magazines	nominal	
New Manila Envelope Cuttings	80.00/	—
No. 1 Assorted Old Kraft	60.00/	65.00
No. 1 Mixed Paper	11.00/	12.00
Box Board Cuttings	10.00/	11.00
Kraft Corrugated Cuttings	90.00/	100.00
Old Corrugated	24.00/	26.00
Overissue News	20.00/	22.00
No. 1 News	13.00/	15.00

BOSTON

Old Papers

(F. o. b. Boston)
Mill Prices, Baled

No. 1 Hard White Shavings, unruled	6.25	/ 6.75
No. 1 Hard White Shavings, ruled	6.00	/ 6.50
Soft White Shavings, Misc.	6.00	/ 6.25
No. 1 Fly Leaf Shavings	—	/ —
No. 2 Fly Leaf Shavings	4.25	/ —
No. 1 Groundwood Fly Leaf Shavings	1.75	/ 2.00
No. 2 Groundwood Fly Leaf Shavings	1.50	/ 1.75
Mixed Colored Shavings	2.00	/ 2.25
New Manila Envelope Cuts, one cut	4.50	/ 4.75
Hard White Envelope Cuts, one cut	7.00	/ —
Triple Sorted No. 1 Brown Soft Kraft	3.75	/ 4.00
Mixed Kraft Env. & Bag Cuttings	4.00	/ 4.25
Kraft Envelope Cuttings	5.00	/ 5.50
No. 1 Heavy Books & Magazines	1.75	/ —
New Manila Envelope Cuttings, one cut	—	/ —
New Manila Envelope Cuttings	4.00	/ 4.25
White Tabulating Cards	5.00	/ —
Groundwood Tabulating Cards	1.50	/ 1.75
White Blank News	2.25	/ 2.50
No. 1 Assorted Old Kraft	3.50	/ 4.00
No. 1 Mixed Paper	.47½/	—
Overissue News	.90	/ 1.00
No. 1 News	.55	/ .60
Box Board Cuttings	.60	/ .70
New Corrugated Cuttings, Kraft	2.75	/ 3.00
Old Kraft Corrugated Containers	2.00	/ 2.25
Old Corrugated Containers	—	/ 1.10
Jute Corrugated Cuttings	1.07½/	—
Paper Strings	2.00	/ 2.25

Bagging

(F. o. b. Boston)

Gunny Bagging—		
Foreign	—	/ 4.75
Domestic	6.25	/ 6.50
Sisal Rope No. 1	6.25	/ —
Sisal Rope, No. 2	5.50	/ —
Mixed Rope	3.00	/ —
Mixed Strings	1.60	/ —
Transmision Rope—		
Foreign	nominal	
Domestic	3.00	/ 3.50
Manila Rope—		
Foreign	nominal	
Domestic	6.50	/ —
Soft Jute Rope	6.25	/ 6.50
Jute Carpet Threads	6.00	/ —
Bleachery Burlap	—	/ 7.00
Scrap Burlap—		
Foreign	6.00	/ 6.25
Domestic	6.00	/ 6.25
South America	6.00	/ 6.25
Wool Tares		
Foreign	6.25	/ —
Domestic	6.25	/ —
Austr. Wool Pouches	7.50	/ —
New Zealand Wool Pouches	7.50	/ —
New Burlap Cuttings	6.50	/ —
Heavy Baling Bagging	5.25	/ 5.75
Paper Mill Bagging	5.50	/ 5.75
No. 1 Roofing Bagging	2.25	/ 2.50

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—		
New Light Prints	.07½/	—
Fancy Percales	.08	/ —
New White No. 1	.11	/ .11¾
New Light Flannelettes	.08	/ .08½
Canton Flannels, Bleached	.10	/ .11
Underwear Cutters, Bleached	.11½/	—
Underwear Cutters, Unbleached	.11	/ .12
Silesias No. 1	.08	/ .08½
New Black Silesias	.04½/	—
Red Cotton Cuttings	.05	/ —
Blue Overalls	—	/ .08½
Soft Unbleached	.11	/ .12
Blue Cheviots	.08½/	.09
Fancy	.06	/ —
Washable	.06	/ —
Khaki Cuttings	.06½/	.07½
Corduroy	.03½/	—
Men's Corduroys	.04½/	—
Ladies' Corduroy	.04	/ —
Khaki Canvas	—	/ .06
B. V. D. Cuttings	.11½/	—

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—		
Repacked	5.00	/ 5.50
Miscellaneous	4.50	/ 5.00
White No. 2—		
Miscellaneous	2.65	/ —
Twos and Blues, Repacked	2.75	/ —
Old Blue Overalls	4.00	/ 4.50
Thirds and Blues,		
Repacked	2.20	/ —
Miscellaneous	1.80	/ —
Black Stockings	3.50	/ 4.00
Roofing Stock—		
No. 1	1.70	/ —
No. 2	1.60	/ —
No. 3	1.50	/ —
No. 4	1.50	/ —
No. 5, Quality A.	1.60	/ —
Quality B.	1.50	/ —
Quality C.	.95	/ —
Old Manila Rope	6.00	/ —

Foreign Rags

(F. o. b. Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)
Mill Prices, Baled

Shavings—		
No. 1 Hard White Envelope Cuts, one cut	$150.00/	—
No. 1 Hard White Shavings, runruled	140.00/	—
No. 1 Soft White Shavings	120.00/	—
No. 1 White Ledger	85.00/	—
No. 1 Heavy Books & Magazines	35.00/	—
White Blank News	80.00/	85.00
Mixed Kraft Env. & Bag Cuttings	90.00/	110.00
No. 1 Assorted Old Kraft	35.00/	—
Overissue News	24.00/	—
No. 1 News	11.00/	—
No. 1 Mixed Paper	11.00/	—
Old Corrugated	23.00/	—
Mill Wrappers	17.00/	—

MARKETS

Blanc Fixe

Prices firm. Market unchanged. Demand strong. Pulp is currently quoted at $85 in bags, car lots at works, 6 cents per pound, l.c.l., deld.; by-product $75 per ton, car lots, at works, 6 cents per pound, l.c.l., deld.

Bleaching Powder

Supply adequate. Delivery good. Prices range from $3.75 to $4 per 100 pound drums, l.c.l. works.

Casein

Market unchanged. Prices steady. Demand registers seasonal mill shutdowns. Current prices on processed acid precipitated casein at 31 to 33 cents per pound for domestic grades and 28 to 29½ cents for imported grades, f.o.b. shipping point.

Caustic Soda

Demand heavy. Supply still shortened by major strike. Solid caustic is reported at $3.10 per cwt.; flaked and ground is quoted at $3.50 per cwt. in 400 pound drums, $4 to $4.25 per cwt. in 100 pound drums—car lots at works; liquid 50 percent in tank cars at $2.50 per cwt.; liquid 73 percent in tank cars at $2.60 per cwt., at works.

China Clay

Supply excellent. Demand steady. Domestic filled clay is $9 to $11.50 per ton, car lots; coating clay is $14 to $22. Imported clay quotation, short tons, $16 to $35, export warehouse.

Chlorine

Supply still disturbed by one major strike. Not likely to improve in view of heavy summer demand. Currently quoted at $2.40 per cwt. in single unit tank cars; at $2.70 to $3.90 per cwt., in multi-unit tank cars, f.o.b., works.

Rosin

Supply good. Domestic buying shows price resistance. Supplies moving to western Europe. Gum rosin in drums per 100 pounds net in car lots, f.o.b. Savannah; B, $6.50; G, H, I, K, $7.40. Wood rosin per 100 pounds net, car lots, f.o.b. Savannah; B, $5.00; FF, $6.50.

Rosin Size

Seventy percent gum and pale wood grades. Supply ample. Demand good. Tank cars, $6.15 to $6.25, f.o.b. southern shipping point.

Salt Cake

Demand continues ahead of supply with slight improvement in shipments. Production under contract. Domestic salt cake is quoted at $25 to $28.

Soda Ash

Supply generally easier, though deliveries behind schedule. Current prices, car lots, per 100 pounds: in bulk, $1.15; in paper bags, $1.40; and in barrels, $1.90.

Sodium Bicarbonate

Strong demand with supply good. Reported as $1.95 per cwt. paper bags, carload lots.

Starch

Prices unchanged. Supply good. Demand eased by mill shutdowns. Pearl grade quoted at $7.00 per 100 pounds; powdered starch at $7.12 per 100 pounds; car lots, New York.

Sulphate of Alumina

Prices unchanged. Supply steady. The commercial grades are quoted at from $1.30 per 100 pounds, in bags, car lots, f.o.b. works. Iron free is $2.50 per 100 pounds in bags, car lots, at works.

Sulphur

Production shows heavy gain. Prices unchanged. Supplies ample. Annual contracts are quoted at $16 to $18 per long ton, f.o.b. mines; the price f.o.b. at Gulf ports is $17.50 to $19.50 per long ton.

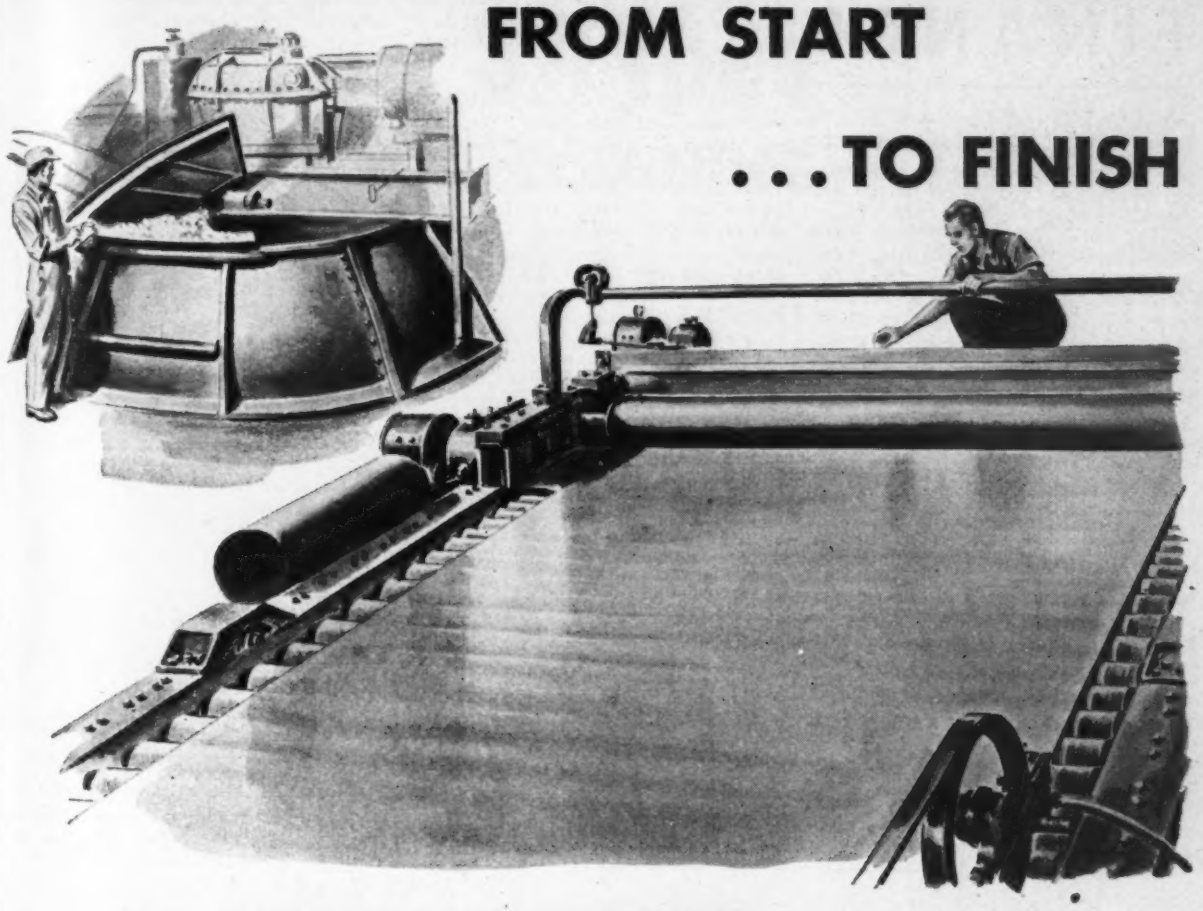
Talc

No change in domestic market. Demand continues far in excess of supply. Domestic grades are currently quoted at $23 per ton in paper sacks, f.o.b. mills; Canadian at $35 and up per ton. All prices in car lots.

Titanium Dioxide

Demand continues extremely tight with no early improvement seen. Prices rise ½c pound. Shipments on allocation. Anastase 18c pound carload lots, 18½-19c l.c.l., rutile, 20c pound carload lots, 20½-21c l.c.l; 50-pound bags, f.o.b. plant, minimum freight allowance.

FROM START ...TO FINISH



You get Better Slime Control in hot weather with Du Pont LIGNASAN®-X

FUNGICIDE AND BACTERICIDE

You can keep your system clean *all the way to the paper machine* . . . even in the hottest weather, when slime build-ups are most serious . . . with "Lignasan"-X.

Added to closed systems, this improved fungicide and bactericide enables you to maintain a slime-free operation with a minimum of make-up water. This is *especially* important in summer months, when water supplies are lowest.

Minimize shutdowns for washing the system by using "Lignasan"-X to eliminate slime in pipes, screens, chests and headboxes.

You'll get fewer slime rejects, too. because "Lignasan"-X helps to prevent smears, holes and breaks in the sheet caused by slime. "Lignasan"-X reduces the chance of sheets sticking to the press rolls.

LOW-COST... QUICK-ACTING

You can use "Lignasan"-X with greater economy. It is inexpensive. And only a few ounces per ton of fiber do the job in most cases. It goes right to work, too, because it is water-soluble for quick action. "Lignasan"-X can be added any place in the system to keep it free of slime.

Our Technical Service Representatives will be glad to show you the latest and most effective ways of using "Lignasan"-X in your paper-making operation. Write E. I. du Pont de Nemours & Co. (Inc.), Grasselli Chemicals Department, Wilmington 98, Delaware.

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FINANCE

Dividends Declared

TORONTO—Dryden Paper Co. reported net earnings of $505,743 for the six months ended March 31, 1948. This is at the annual rate of $4.15 per share after normal depreciation, and compares with earnings last year of $2.64.

Dryden advised that the directors have accepted a subscription for 10,000 shares of unissued common stock at $25 per share. A subscription of 20,000 shares was accepted in February 1948 at the same price. Managing Director E. L. Goodall also has an option to purchase 10,000 shares of unissued common at $19 a share. As in the earlier subscription, it is stated that the offer accepted by the board this week was received from a company at present a shareholder of Dryden Paper Co. and in which none of the directors has any interest. Proceeds of the sale of the shares will be used by Dryden to pay off a bank loan in whole or in part and for other corporate purposes.

As of Sept. 30, 1947, there were 150,000 shares of common stock issued and outstanding of a total authorized issue of 300,000. Sale of 30.000 shares at $25 will bring total issued shares to 180,000.

At the last meeting of the board of directors, a dividend of 25c per share was declared. It was thought advisable at this time to maintain the present rate of dividends until the fiscal position of the company had been determined at the close of its year.

WASHINGTON—A special meeting of stockholders of Lily-Tulip Cup Corp. was called for July 27 to consider increasing authorized common stock from 250,000 to 500,000 shares and to authorize a preferred issue of 30,000 shares at $100 par value. Now outstanding are 213.539 shares of no-par-value common. There is no preferred stock outstanding. It is planned to sell the 30,000 shares of preferred to two insurance companies. Additional shares of common are not to be offered at this time, according to the proxy statement.

CHICAGO—Container Corp. of America declared a regular quarterly dividend of $1 on the preferred stock, payable September 1 to holders of record August 20.

DONNACONA, Que. — Donnacona Paper Co., Ltd., voted a regular quarterly dividend of $1.12½ on the preferred, payable August 16 to shareholders of record July 15.

HAMILTON, Ohio — Champion Paper & Fibre Co. reported net income of $1,590,768 or $1.35 per common share for the third quarter, after reserves of $525,000. Sales for the fiscal year ended last April 25 were at record levels, totaling $67,611,197. Net income was $5,375,645 or $4.47 per common share.

Possible Benefits

(Continued from page 9)

case with the Study Group over the past several months; (2) large consumers of waste paper were not too worried about defining what they purchased in the pre-war years when their demands were far less. Now, they would perhaps be interested in adopting parts or all of a fair set of standards and practices as a basis for each purchase order; (3) our waste paper industry has never, up to now, felt that it was to its long range benefit to establish such a set of standards.

I agree with Harry Sackett. We lack standards mostly because of the tremendous pace of our growth. I also agree that we have matured to a point where we must pause long enough to set up a framework of rules to go by.

Taking a look at the disadvantages and advantages of such a setup from the waste paper dealer's point of view, some of the following pros and cons come to mind.

First—the disadvantages. We waste paper dealers are individualists by nature. We want nothing that will unfairly repress our business' steady growth. I know you will all agree with that. Let us for a moment, however, see whether a fair set of standards would be repressive or not.

Anyone of us who thinks that he is now operating without any rules of definition or practice is certainly mistaken. Every shipment that any waste paper dealer makes is more or less in conformity with *somebody's* idea of what that shipment should be. Speaking as a representative of Acme Paper Stock Co., I know that I can make shipments to Mill "A" which might be totally unacceptable to Mill "B." I also know that I may make shipments to Mill "C" which will or will not be acceptable, depending upon the grader or inspector on duty at the time my shipment arrives. In other words, not only do I now operate under a very definite set of standards, but I operate under three or four dozen sets of standards! So I say that one widely-agreed-upon set of standards is not an additional repressive burden but is rather a simplification of the whole confused situation.

If I were to ship a car of No. 1 kraft paper that conformed to a definition agreed upon in a set of standards and practices, it would make no difference whether that shipment went to Mill "A," "B," or to either of the inspectors at Mill "C" because they would be obligated to accept my shipment if it conformed to a definition to which we had all previously agreed.

I see an all-inclusive fair set of standards and practices as a simplifier of waste paper trading and I see it as a real and valuable device for removing the many, many sets of standards under which each of us now operates.

Furthermore, a set of standards and practices will enable those of us who try to pack quality merchandise to receive credit and recognition for our efforts. Grade definitions will pretty well enable mills to quickly distinguish between various qualities of packings within each major classification and I believe you will agree that a system which will tend to reward packers of top quality merchandise will prove of long-range benefit to us all.

I am sure every dealer present will agree that we could do with far less friction between ourselves, and between ourselves and customer mills, and that clearly stated standards and practices will go a long way in this direction.

And finally, those of us who broker waste paper will surely agree that our day-to-day business activities would be far more pleasant if we could be surer that we are delivering what is purchased.

If you will glance through the First Report of the Study Committee on Waste Paper Standards and Practices, you will note throughout that reference is made to "the buyer" and "the seller" of waste paper as contrasted to the use of the terms "mill" and "dealer." This is very important. It means that the standards and practices that may eventually be adopted will apply to all waste paper transactions, whether between mill and broker, broker and dealer, mill and dealer, or dealer and shop.

As a broker, I would become a buyer of waste paper, and the dealer or mother broker from whom I might buy, would become a seller. As a buyer, I would be just as bound by definitions as I would be when I in turn resold the shipment to a mill.

If I bought on the basis of a proposed set of standards and the material was sold to me on the basis of those standards, I could then feel comfortable with respect to what I was buying and I could in turn honestly represent to the mill that the shipment would conform to the same set of standards as the mill recognized.

In other words, much of the "adventure" would be taken out of each individual waste paper transaction. Dealers and brokers alike could feel secure in knowing that if a shipment conformed to a published set of standards under which the mill had issued its purchase order, that shipment would be acceptable regardless of the grader, general market conditions, or specific business condition at that mill.

In closing, I would like to say that I am wholly in accord with the purpose of the Study Committee on Waste Paper Standards and Practices and that it is my sincere hope that our members can take the leadership in making a workable set of standards and practices a basic fundamental of all waste paper trading.

Your Choice - 3 Types OF BETTER AIR CLEANING

FANS by Buffalo

1 "BUFFALO" AIR WASHERS

Where humidifying PLUS thorough air washing is desired, "Buffalo" Type A, Type B or Type C Air Washers offer a highly effective range of efficiency easily installed units for comfort and process control. Where recovery of by-products is needed, you will have excellent results with "Buffalo" Type "TE" Washers. All are described in Bulletin 3142-C. Write for your copy.

2 "BUFFALO" WET GLASS CELL AIR WASHERS

Shown above, this unit first wets the air with finely atomized spray, then draws it through filter packs of dense, wetted glass fibre. Available, if desired, with tempering and reheating coils.. Write for Bulletin 3457 for details on this quiet-running, trouble-free unit.

3 "BUFFALO" COMFORT CONDITIONING CABINETS

Here is efficient air-cleaning for comfort and health—plus other desired air conditioning functions: (1) humidifying and heating, (2) cooling and dehumidifying, (3) simple summer cooling. At right is the new Model "F" Type "VPC" vertical cabinet, now in three basic sections: blower head, coil and tank. Capacities from 2000 to 22,000 cfm of conditioned air. Write for new Bulletin 3664 and see how much these compact units offer.

EQUIPMENT FOR

- ★ VENTILATING
- ★ HEATING
- ★ COMFORT COOLING
- ★ PROCESS COOLING
- ★ AIR TEMPERING
- ★ AIR WASHING
- ★ EXHAUSTING
- ★ BLOWING
- ★ FORCED DRAFT
- ★ INDUCED DRAFT
- ★ PRESSURE BLOWING
- ★ CLEANING
- ★ DRYING

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Scandinavian Wood Pulp

(Continued from page 7)

war years and the record pre-war year, 1937, and the year 1938, as shown in Table III.

It is anticipated that the export of pulp for 1948 will be about ten percent above the 1947 figures.

The European supply picture, in brief, adds up to a net increase in available supply of chemical grade market pulp for 1948 of 100,000 to 150,000 short tons. Nearly all of this increase will be in the bleached grades.

Demand: Although most European countries need considerably more pulp than they can afford to buy, most of them will nevertheless be able to buy somewhat more this year than they did during 1947. Only two countries, England and the Bizonia section of Germany, can be said to be active prospects for a relatively large tonnage increase over 1947. The pulp trade between the Scandinavian countries on the one hand, and the various European countries on the other, is governed in many instances by bilateral trade agreements. These agreements are designed to permit or restrict the shipment of goods to the extent that the signators to the agreements want, or do not want, each other's currencies.

England's aggregate purchases of chemical wood pulp for the year 1947 were reported as follows: Bleached or bleachable, 240,000 short tons; strong unbleached sulphite, 170,000 short tons; unbleached sulphate, 190,000 short tons; total, 600,000 short tons.

The above tonnage is equivalent to, roughly, 50 percent of the pre-war British imports of chemical wood pulp.

TABLE I
NORWEGIAN PRODUCTION AND EXPORTS
(In short tons with ,000 omitted)

	1937		1938		1947	
	Total	Export	Total	Export	Total	Export
Mechanical	598	354	490	301	338	152
Sulphite	528	362	442	267	286	103
Sulphate	81	29	59	18	67	9
Paper	457	361	368	271	447	288
Board	56	25	45	18	42	28
Totals	1,720	1,131	1,404	875	1,180	580

TABLE II
SWEDISH CHEMICAL PULP EXPORTS
(In short tons with ,000 omitted)

	1937	1938	1946	1947	Est. 1948
Sulphite—Bleached	433	335	438	491	573
Sulphite—Unbleached	1,002	783	631	585	559
Sulphate—Bleached	96	102	77	151	191
Sulphate—Unbleached	892	634	542	509	498
Totals	2,423	1,855	1,688	1,736	1,821

TABLE III
FINNISH EXPORTS OF WOOD PULP
(In short tons with ,000 omitted)

	1937	1938	1946	1947
Sulphite	908	738	284	373
Sulphate	392	388	225	332
Mechanical	320	266	97	97
Total	1,620	1,392	606	802

It is estimated by a reliable source that British requirements for 1948 will be 80,000 to 100,000 short tons above 1947.

Because of the favorable British trade balance with Sweden, it is anticipated that a substantial part of England's additional requirements for 1948 will be purchased from Sweden.

Sweden's exports of chemical pulp to England for the year 1946, 1947, and the first quarter of 1948 were as shown in Table IV.

England's estimated requirements from Sweden for the year 1948 are: 280,000 short tons of paper grade chemical pulp, and 75,000 short tons of dissolving pulp. This is approximately 80,000 tons more than it purchased from Sweden during 1947.

The British contract pulp prices for the six-month period of July-December, 1948, are roughly equivalent to the third-quarter prices being paid by American consumers for Swedish pulp.

Bizonia's total purchases of chemical pulp for the year 1947 and the first six months of 1948 were reported as shown in Table V.

The Bizonia pulp purchases are currently being negotiated by Miss Virginia Peterson as representative of the Joint Export-Import Agency. Although the prices paid are in some instances slightly higher than the equivalent Scandinavian prices in the American market, they are lower than the prices

TABLE IV
SHIPMENTS TO ENGLAND—SHORT TONS

	1946	1947	3 mos. 1948
Sulphite—Bleached	65,250	88,326	18,045
Sulphite—Unbleached	147,785	83,597	21,518
Sulphate—Bleached	17,109	27,501	5,846
Sulphate—Unbleached	110,771	77,399	14,887
Totals	340,915	276,823	60,296

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TABLE V
PURCHASES IN SHORT TONS

	1947	6 mos. 1948
Sulphite	9,000	8,000
Sulphate	46,000	22,000
Rayon (88/89%)	5,000	4,000
Refined (94%)	2,000	2,000
Total	62,000	36,000

paid by the other continental countries.

The Association estimates that Bizonia will require the following tonnages during the last six months of 1948: Sulphite, 12,000 short tons; sulphate, 40,000 short tons; rayon (88/89 percent), 6,000 short tons; refined (94 percent), 3,000 short tons; total, 61,000 short tons.

Part of the foregoing tonnage is expected to come from Sweden under the provisions of the bilateral trade agreement which permits the shipment of 75,000 metric tons of Swedish pulp during 1948 in exchange for German industrial goods. It is understood that negotiations to buy pulp are also under way with Finland, Canada, and the United States. In view of the high European pulp prices, the Bizonia officials are investigating the possibilities of securing a portion of the normal Canadian and United States exports of pulp to help fill their requirements.

The South American and Mexican demand for pulp is said to be very low at the present time. The paper market in Brazil is reported to have suffered a "break" during the spring months with the rate of production being sharply curtailed. Exchange restriction recently imposed by Argentina has temporarily stopped the importation of European pulp into Argentina.

The American market for European pulp appears to be suffering from a severe case of indigestion caused by the high Scandinavian prices. One competent Swedish industry official reports that sales to the United States are down 50 percent for the third quarter. He estimated that if the present European price level is maintained, the United States will buy 200,000 short tons less pulp from Sweden and Finland this year than during 1947. There are already indications of easing European prices in the American market. One Swedish producer with 5,000 tons of unbleached sulphate on dock in the States is offering it at $140. So far it is not reported sold.

Exchange and Devaluation

During July of 1946, the Swedish government increased the value of the Swedish Kronor, the official monetary unit, by approximately 16 percent from Sw. Kr. 4.20 per dollar to Sw. Kr. 3.58 per dollar. Since the Swedish producer's costs and selling price are based on Swedish Kronor, even though his price is quoted in dollars in the States, this revaluation necessitated an in-

MATERIAL HANDLING News

Positioning heavy steel tubing for lathe operator by gas-powered Trucloader

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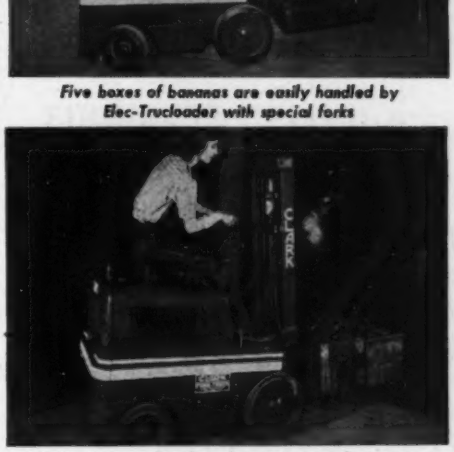

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crease in the quoted dollar price of pulp destined for this market.

Although the Swedish government has since maintained this official rate of Sw. Kr. 3.58 per dollar, the real value of the Swedish Kronor as measured in the "free" money markets has deteriorated until at present it varies between Sw. Kr. 5.20 and Sw. Kr. 5.40 per dollar. Despite this deterioration in the value of the Swedish monetary unit, I do not believe that the Swedish government, of its own volition, will revalue at this time. There is a feeling among business men in Europe, however, that the Pound Sterling will evantually succumb to the pressure for devaluation. If this happens it is believed that the Swedish government will adjust the value of their monetary unit to conform with the new value of the Pound Sterling.

A similar situation prevails in Finland where the monetary unit is the Finmark. The official rate for the Finmark is 78 cents per 100 Finmarks while in New York on the "unofficial" money market it is worth only 14 cents per 100 Finmarks.

It is interesting to note that some Swedish pulp producers, selling in Sterling area countries, demand guaranteed rates of exchange in those instances where the price of their pulp is quoted in other than Swedish Kronor.

A New York importer is reported to have attempted to borrow 500,000 Swedish Kronor from one of the leading banks in Stockholm in order to pay for pulp shipments to the United States. The bank agreed to the loan but the Riksbank refused to approve it.

WAXING ENTHUSIASTIC

William P. Patterson, (right), of the Specialty Papers Co., Dayton, Ohio, newly-elected chairman of the Waxed Paper Institute executive committee, extends congratulations to Harold L. Bills (left), of the Saniwax Paper Co., Kalamazoo, Mich., at the conclusion of third year of activity of the National Merchandising Program of which Mr. Bills is chairman. Ceremonies took place at the Summer Meeting of the Institute at Hot Springs, Va., June 10-11. The lady is Miss Martha Cosby, professional model.

Swedish Export Tax

The protest which we made to the State Department against the inconsistencies of an export tax on the one hand, and the request for Marshall Plan aid on the other, was forwarded to the American Legation in Sweden.

Mr. Matthews, the American Ambassador to Sweden, asked the principal Swedish producers if they would reduce the price in the event that the tax was eliminated. Only one producer indicated that he would reduce his export price dollar for dollar with the reduction in the $14 export tax. In view of this, Mr. Matthews is holding in abeyance an official protest to the Swedish government.

Conclusion

It is difficult to summarize the many complex factors affecting the European supply of market pulp. Unquestionably, European demand for wood pulp is growing. At the present time a part of the European demand is not economically vocal, i.e., although many countries could use substantially larger tonnage than they did during 1947 they simply cannot pay for the extra tonnage; or, if they can pay, the pulp-producing countries may not be willing to accept their currencies.

England and Bizonia are both eager and able to buy an estimated 125,000 tons more than they received last year. The rest of Europe, with the possible exception of France, will probably buy the same or slightly more than they did during 1947. Indications are that South America, Mexico, and the United States will buy substantially less European pulp at present price levels than they did last year.

The two factors reducing the American demand for European pulp are the increased shipments of lower-priced domestic and Canadian market pulp, and curtailment of production by some of the nonintegrated mills depending on European pulp.

Simon Travelers Protective Ass'n. First V-P

ALBANY, Ga.—Ben W. Simon, president of the Albany Paper Co., has been elected first vice-president of the National Travelers Protective Ass'n. Mr. Simon has held all of the Georgia offices of the association, including the post of president.

OBITUARY

H. Lester Paddock, 88, dean of the central New York paper-making industry and a community leader in Fulton, N. Y., for a half century, died on June 22 in St. Joseph's Hospital, Syracuse, N. Y.

Mr. Paddock was chairman of the board of directors of the Oswego Falls Corp., which operates a paper and pulp mill at Fulton, the development of which he directed. He was also chairman of the board of the Sealright Co., Inc., of Fulton.

Born in Wolcott, N. Y., Mr. Paddock was educated in the Wolcott schools and at Cazenovia (N. Y.) Seminary. He started his business career with the Wolcott banking firm of Roe, Ellis & Pomeroy and later was associated with the Hamilton & Matthews Rochester, N. Y. wholesale hardware concern.

He became vice-president of the Lakeside Paper Co. of Skaneateles, N. Y., in the late Eighties and was an incorporator of the original Oswego Falls Pulp & Paper Co. in Fulton. In 1894 he moved to Fulton and later became president and general manager of the Oswego Falls Corp., a post he held for 40 years until his retirement as operating head to become board chairman.

Fred W. Rosso

Fred W. Rosso, 56, general superintendent of the machine shop of the Bagley & Sewall Co., Watertown, N.Y., died on June 20 in the House of the Good Samaritan where he had been a patient since May 17. Mr. Rosso was associated with the firm for more than 30 years.

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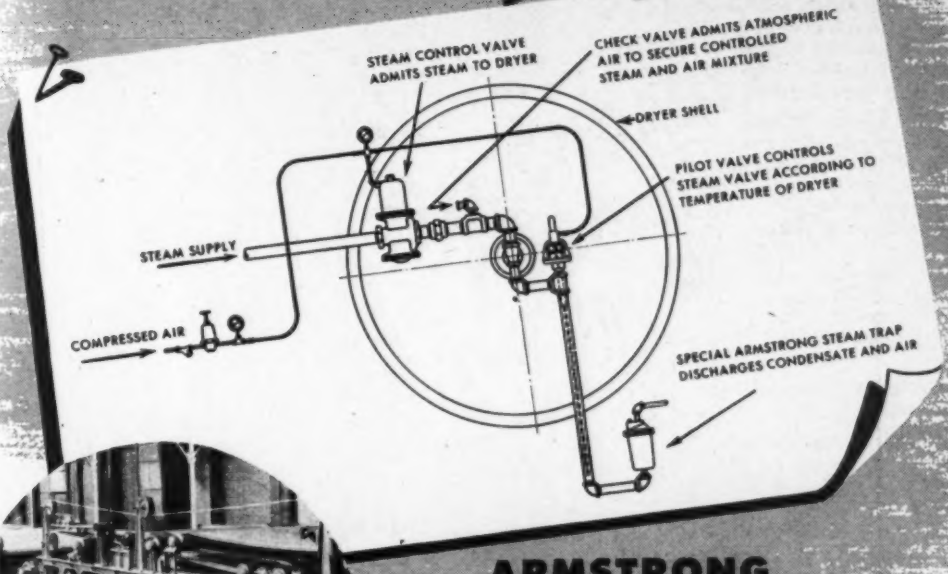
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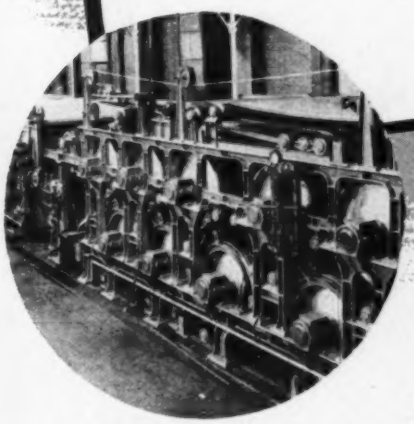

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Alkali Output Cut

(Continued from page 7)

March, likewise an all-time record.

Production of synthetic anhydrous ammonia shrank from the 100,142 tons recorded in March, when all plants operated at capacity, to 92,640 tons in April, or slightly below the April, 1947, total.

More recently an important ammonia plant at South Point, Ohio, was shut down by a labor-management dispute, which has "adversely affected output of manufacturers of industrial explosives," the Commerce Department said.

The shutdowns led to cutbacks in chlorine. The Commerce Department said "a shortage of the commodity has resulted. Other producers have channeled available supplies to municipalities which lack chlorine for water treatment."

Of 35 major inorganic chemicals surveyed by the Census Bureau, 24 were produced in smaller volume and nine in greater volume in April than in March.

Production of 24 was greater and of ten smaller than in April, 1947.

Sulfuric acid was among the inorganics produced in heavy volume. Recording declines from March was ammonium nitrate, calcium carbide, hydrochloric acid, nitric acid and phosphoric acid. Of this group, only sodium sulfate showed a gain over March.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1948		Corresponding Weeks—1947	
May 15	100.4	May 17	105.3
May 22	100.3	May 24	105.1
May 29	98.9	May 31	105.6
June 5	92.9	June 7	106.7
June 12	95.0	June 14	107.2
June 19	*95.3*	June 21	106.1

COMPARATIVE MONTHLY SUMMARIES

1947						1948	
Jan.	102.1	May	106.2	Oct.	109.5	Jan.	100.9
Feb.	105.9	June	106.0	Nov.	109.3	Feb.	100.3
Mar.	106.1	July	93.5	Dec.	101.5	Mar.	100.6
Apr.	105.1	Aug.	104.2			Apr.	102.5
		Sept.	102.0	Year Avg.	104.3	May	*100.4*

COMPARATIVE YEARLY SUMMARIES

	1941	1942	1943	1944	1945	1946	1947	1948
Year to Date	93.5	99.1	88.8	88.6	88.9	100.4	105.5	*99.9*
Year Average	97.4	90.4	87.8	88.1	89.4	101.1	104.3	

NOTE: *As of January 10 capacity base increased by* v*3.3%*

PAPERBOARD OPERATING RATIOS†

Current Weeks—1948		Corresponding Week—1947	
May 15	100	May 17	102
May 22	100	May 24	101
May 20	100	May 31	98
June 5	87	June 7	98
June 12	101	June 14	103
June 19	*97*	June 21	102

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1947	99	103	101	100	101	101	90	99	96	101	99	89	98
1948	99	100	102	102	*100*								

* Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association.

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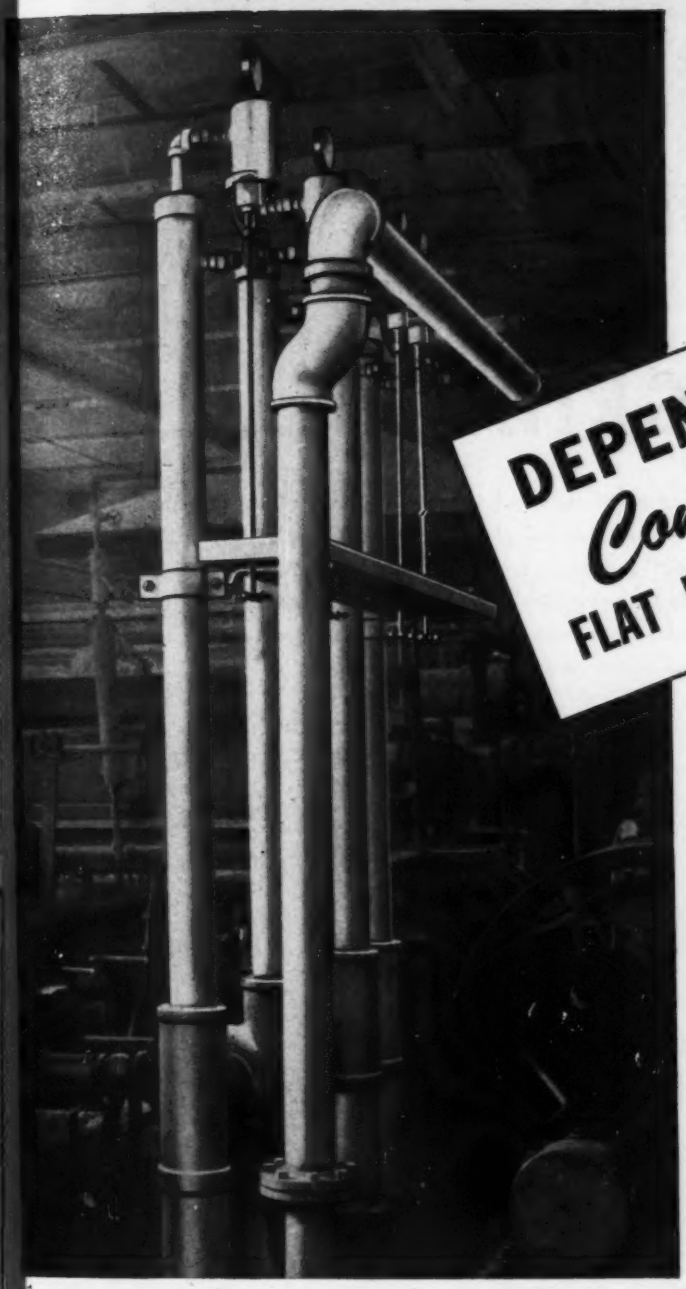

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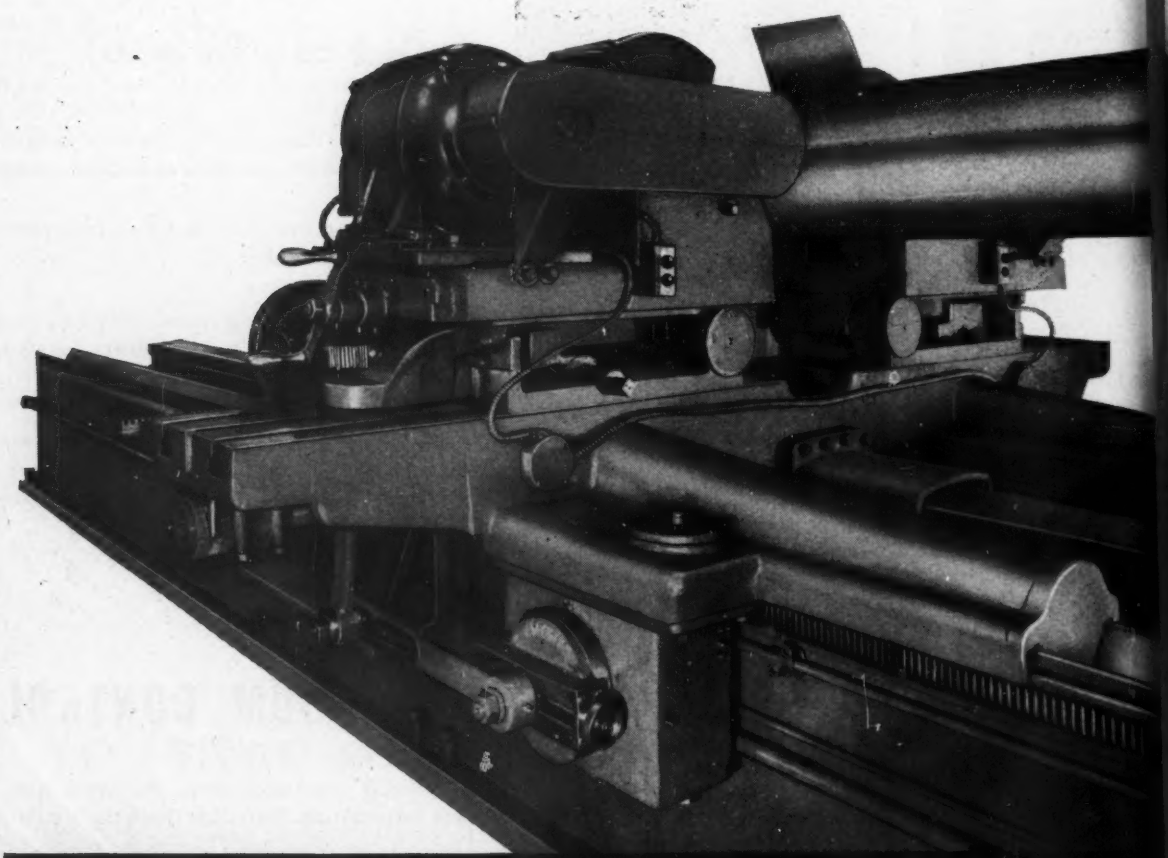

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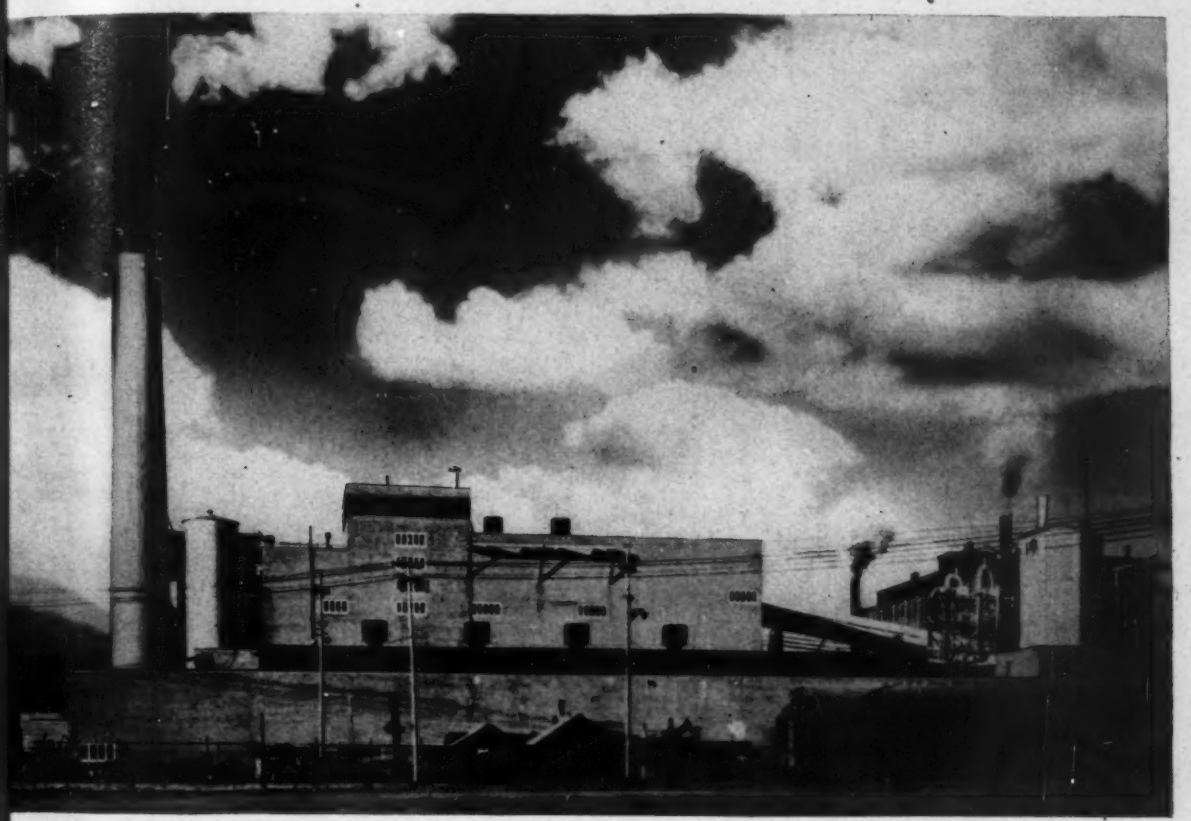


The new Burgess Kraft Mill. The Burgess Sulphite Mill may be seen in the background at the right.

Frederic G. Coburn
President
The Brown Company

The Brown Story

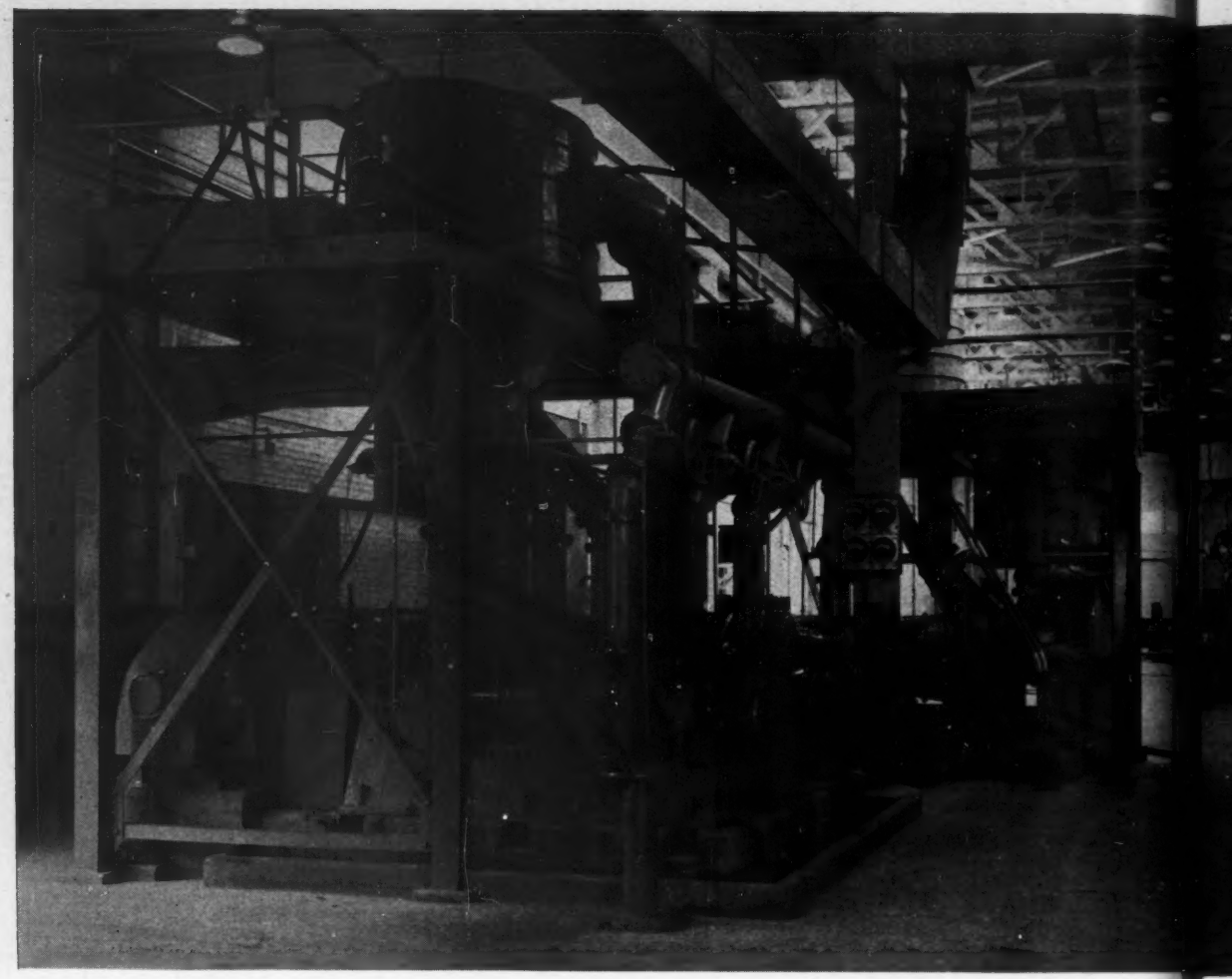
By E. P. McGinn, Industrial Editor, Paper Trade Journal
in collaboration with
A. W. Warren, Jr., Public Relations Dept., Brown Company

The pulp industry of the Northeastern United States received a much needed stimulus from the opening of the new kraft mill at Brown Company, Berlin, N. H. Although the total pulp production at Berlin will remain at about 400 tons per day, the change of one half of the output from Sulphite to Sulphate is quite important. The principal reason for the new modern kraft mill at Berlin is to supply pulp to be made into the well known Nibroc Towels and Nibroc Converting papers.

The manufacture of kraft pulp is not new to Brown Company, as its Canadian subsidiary, Brown Corporation, was one of the first mills on the North American Continent to make this product. This mill was built in 1910 at La Tuque, P.Q. and is now producing Sulphate pulp at more than 400 tons per day in 12 digesters. The La Tuque mill was the first to commercially produce high Alpha Sulphate pulp and some of its products such as Cellate and Solka pulps have become world famous. Two Minton vacuum driers are used to dry the pulps for shipment to their many users.

Now that the new mill has begun operation at Berlin, La Tuque will place more and more emphasis on the production of these specification pulps.

No overnight decision brought the new mill and the new machine to Brown Company. The entire project was the result of long and careful study. Manufacturing, woods, sales, re-



GENERAL VIEW of stock preparation system and paper machine room. Dilts Hydrafiners at left. Emerson Jordans, left center. Bird screens at extreme right.

search and financial personnel made detailed examination of market, raw material supply and manufacturing problems. One of the studies brought into the picture a most modern method of surveying the basic raw material—wood.

Pulpwood Resources

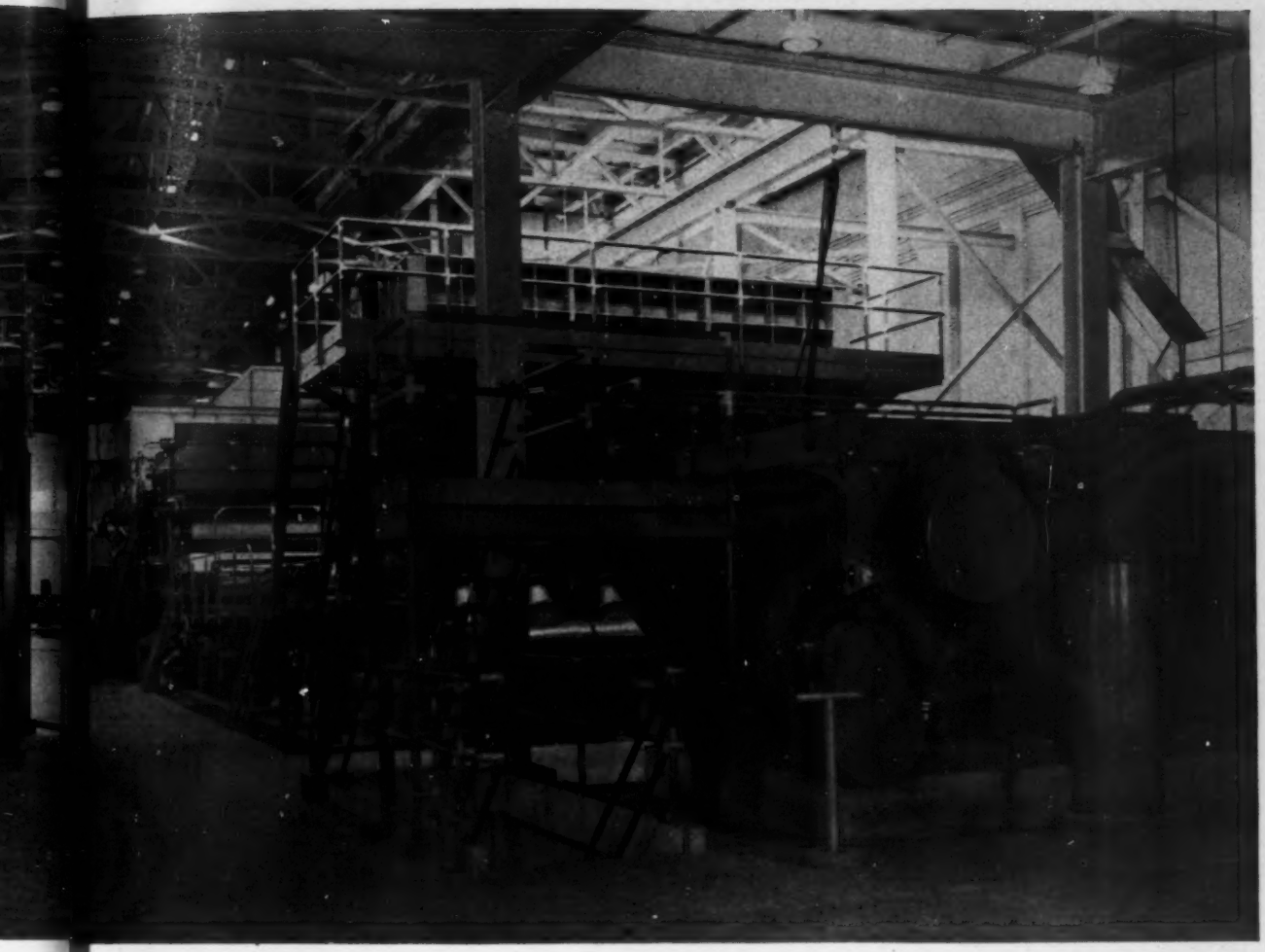
Tomorrow's wood supply is today's most important problem in our industry. Adequate and constant pulpwood supply is the basis of continuous operation and future planning. An assured supply of pulpwood is a firmer foundation for a pulp and paper mill than the bed-rock on which it rests.

A thorough reorganization of the Woods Departments of the Company and of its Canadian subsidiary was commenced in March, 1943. This has resulted in important changes in timberland management, purchased pulpwood acquisition and methods of operation. Men with special training were added to strengthen personnel. Long-range objectives were set and work commenced to attain them. After five years, achievements have been constructive and of far-reaching effect.

The value of these achievements can be best appreciated in the light of a few facts and figures indicating the magnitude of the combined operations of the Woods Departments. For example, these Departments together produce and procure an annual average of approximately 600,000 cords of pulpwood. This is equal to about 40,000 rail carloads. These come from areas aggregating annually an average of 80 square miles. In the production and delivery of this quantity of pulpwood there are employed on the average 300 mechanized units, such as tractors, bulldozers, graders, trucks, marine equipment and the like. At the peak of the cutting and transport season there are about 6,000 men employed in the production and delivery of pulpwood. The Woods Departments have built and have continued to maintain about 400 miles of all-season truck roads.

The timberlands of the Canadian subsidiary consist of 837,296 acres of freehold and 1,669,338 acres under lease-hold. Brown Company owns outright in New England 441,597 acres. It also owns 90,190 acres as its share of certain lands held in co-ownership with other parties. Besides its own timber holdings the Company has access to other sources of pulpwood close to Berlin. These sources include privately owned farms and small wood lots and public and other private woodlands. Combined they constitute an adequate source of pulpwood.

When plans were made for a new sulphate mill at Berlin, it was necessary for the Company to know as quickly and as accurately as possible what pulpwood resources were available on a sustained yield basis. This became even more important and urgent because several species of wood which heretofore could not be utilized in the sulphite pulpmaking process would be suitable for the new sulphate mill. At this point, a method of estimating timberlands, new and unusual in the Northeastern United States, was introduced—the aerial photographic survey.



The Woods Departments had to survey 13,760 square miles of timberland. By the conventional ground cruising method this would have taken many years. Therefore, the Company became one of the first forest industries in the United States to make an aerial survey. Since neither textbooks nor experienced men were available to interpret the picture and compute tree volume from their analysis, the Woods Department had to train its own men in the use of stereoscopes and other instruments.

This survey, completed in July 1944, enabled the Company to analyze the potential timber resources of the region economically tributary to Berlin. Current checks on the analysis were made by crews of expert ground cruisers. The study proved conclusively that, wood resources will last indefinitely and provide a yardstick for annual cutting.

Sulphite Pulping

The Burgess sulphite mill now operates at a rate above 200 tons per day and utilizes both hardwoods and softwoods in the production of high grade solka fibres for both the paper and dissolving industries. Since the removal of bark from hardwoods is generally more difficult than with softwoods, an increase in de-barking capacity was accomplished by the installation of an Allis-Chalmers Steambarker. There are seven drum barkers now in use in addition to the new hydraulic barker.

After the woodland survey had been completed, the decision was made to build a 200 ton per day kraft mill, the wood consumption of which was coordinated with the reduced capacity of the present Burgess Sulphite mill. Consequently, only 8 of the original sulphite digesters are now in use. These digesters are 54 feet high by 18 feet in diameter and each cook produces 14.5 tons of hardwood pulp or 12.9 tons of softwood pulp.

The grades of sulphite pulp that have been discontinued are the paper making grades which have been superseded by the new kraft pulps. There has been no change in the production

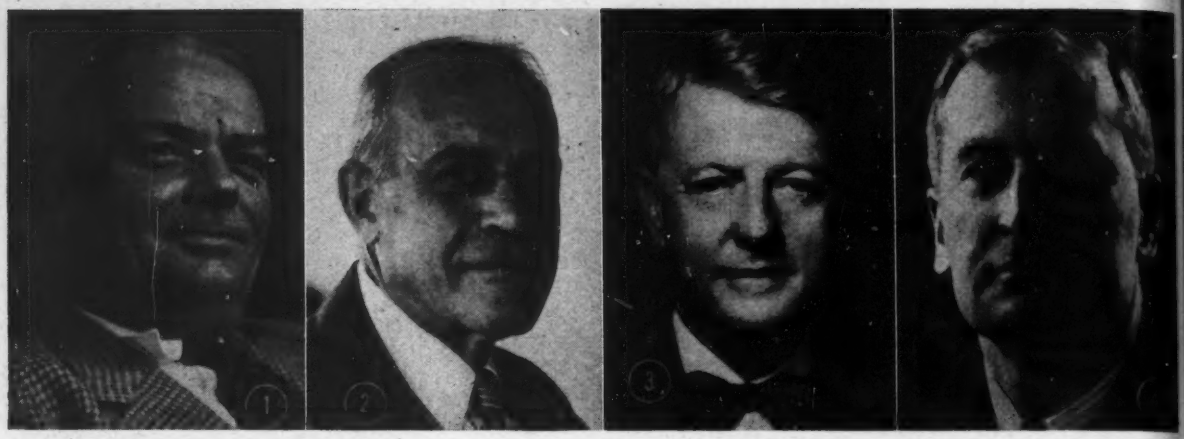
STATEMENT BY PRESIDENT FREDERIC G. COBURN

The board of directors of Brown Co., which took over the management of the company in the autumn of 1941, was faced with the necessity of modernizing the company's mills. The directors' first problem in connection therewith was to decide upon the segment of the company's business in which the first work should be undertaken. The conclusion was to attack first the Nibroc Towel Division. In order to buttress it firmly for the future, a modern high speed paper machine with associated construction and converting equipment was decided upon, and to back it up, a new and modern sulphate mill supplying slush pulp with resultant lower costs and controlled qualities.

With the beginning of World War II, the company had, of course, to forego construction until the end of the war was in sight. Contracts were let in the beginning of 1946, and this major improvement is now completed and operating.

Concurrently, a program of modernization has been under way in the company's market sulphate mill at La Tuque in the Province of Quebec.

It is the intention of the management to continue this work of rebuilding and modernization.



(1) H. G. Schanche, vice-president in charge of woods operations. (2) E. H. Maling, vice-president in charge of finance, accounting and finance, treasurer. (3) D. P. Brown, vice-president in charge of sales (4) Wentworth Brown, vice-president in charge of manufacturing.

of specification high alpha pulps or dissolving pulps made at the Burgess Sulphite mill.

The sulphite Mill at Berlin is somewhat unusual in that much of the pulp is cooked with soda base sulphite liquor. Pulps can also be cooked with calcium base liquor or a mixture of the two can be used. This mill was originally arranged so that two kinds of pulp could be cooked and bleached simultaneously, but with the advent of the new kraft mill, was reduced to a single system.

Paper Mills

There are two paper mills in Berlin although only the Riverside Mill is actually located in Berlin. The Cascade Mill is downstream about 2 miles in Gorham, N. H.

The Riverside Mill has two Fourdriniers each trimming about 90 inches. These machines are used almost exclusively for the manufacture of high quality specialties.

The Cascade Mill has five Fourdriniers including the new 196 inch machine which is described in detail in another part of this article. The four older machines all trim 150 inches. Two of these machines are equipped with calender stacks and are used for making engineered converting papers. The other two machines are being used for making towels at present but eventually they will be remodelled and equipped with calenders and used for specialty and specification papers, including abrasive backing, asphalting, twisting, spinning, varnishing, flour bag, feed bag, potato sack, coffee bag and multi-wall bag papers.

Specialty Products

The diversity of products of Brown Company is well illustrated by the Onco Division. In this mill, a heavy base sheet made from Solka pulp is impregnated with emulsified elastometers and then cured, to produce sheets of strong flexible material suitable for innersoles, sockliners and synthetic leather.

A part of Brown Company that is not ordinarily found in pulp or paper mills is the chemical division. The production of this division is built around the electrolytic chlorine and caustic soda plant. Part of the chlorine and caustic soda is used for pulp bleaching and purification and water purification at Brown Company mills. Some of the excess caustic soda is sold as liquid caustic for use in other industries and part of it is used with some of the chlorine to make soda bleach which is also sold to other industries. Part of the chlorine production is used to make chloroform in two grades, technical and U.S.P. grade. Another product, of this division is paracymene, which is used as a solvent.

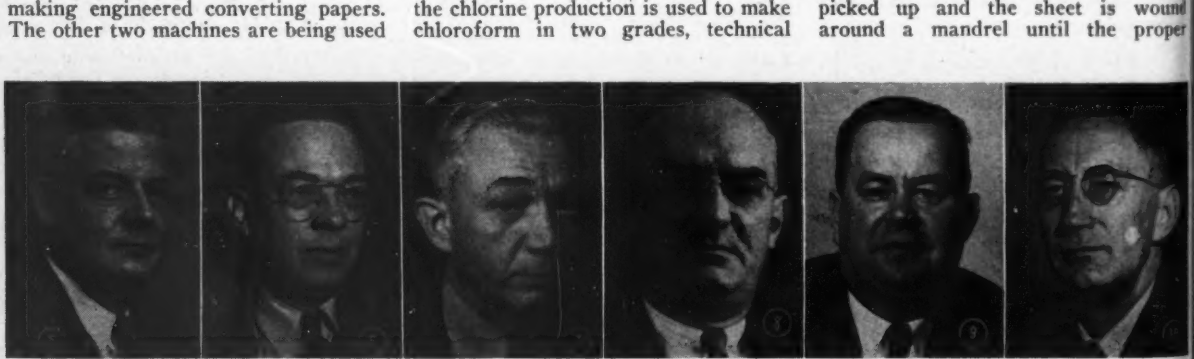
A department which was developed entirely through Brown Company research is the "Floc" Division. The product of this division is finely divided Solka Cellulose. During the war its principal use was as a constituent of the flux coating applied to welding rods. Since the end of the war demands for this purpose have decreased. However, other uses in new products and fields will probably make it necessary to increase this production.

"Bermico" Fibre Tubes

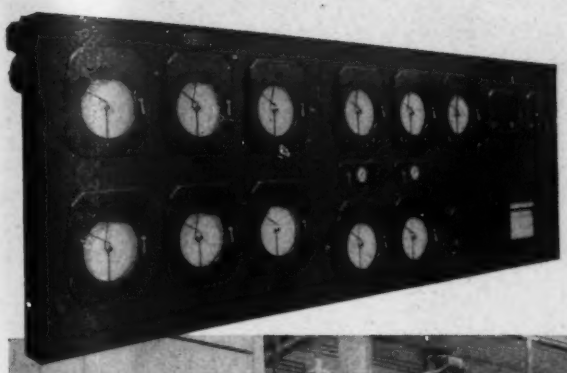
One of the most unusual manufacturing operations at Berlin is the tube mill. Here fiber tubes are made and dried and then completely impregnated with pitch. The resultant product, which is sold under the well known "Bermico" trade name is used for sewer pipe and underground electrical conduit.

A mixture of pulps carefully selected to produce a tube of the proper characteristics is treated in regular beaters and jordans and then pumped to the wet machine. These machines are about 110 inches wide at the wet end.

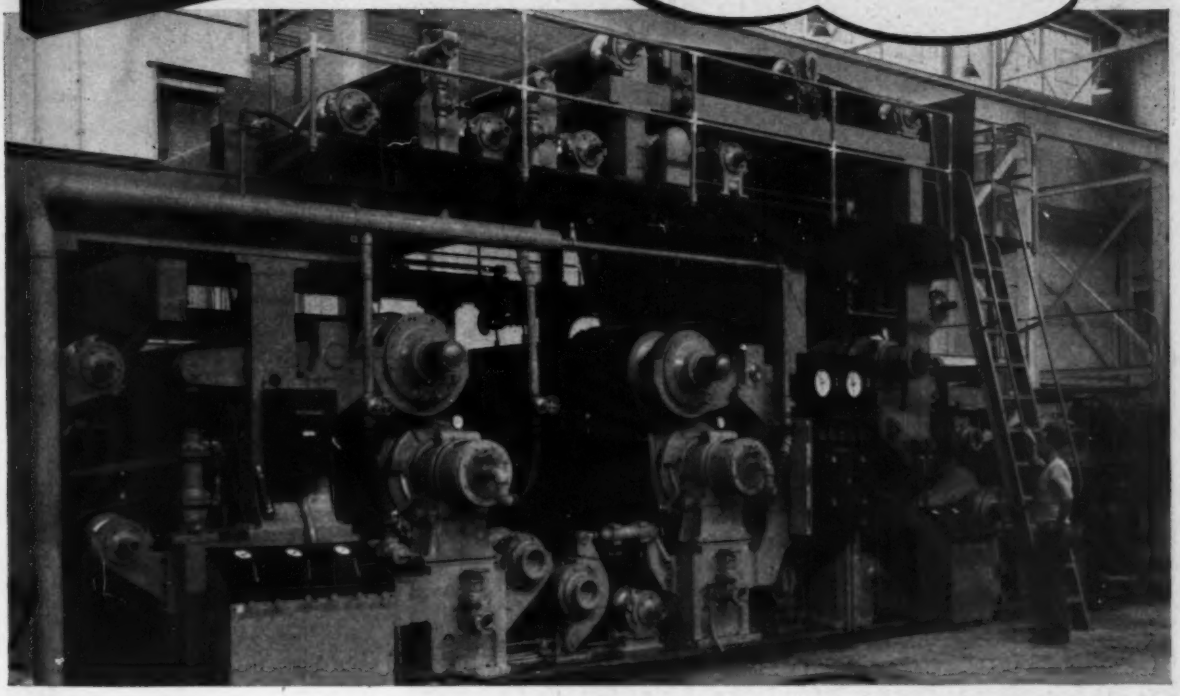
The stock in the wet machine is picked up and the sheet is wound around a mandrel until the proper



(5) G. A. Day, director of research and development. (6) L. M. Cushing, manager, pulp manufacturing. (7) J. R. Almand, general superintendent, paper division. (8) E. E. Morris, works manager. W. A. Johnson, manager, paper division. (10) C. R. P. Cash, general superintendent, pulp manufacturing division.



O.K., MR. NIBROC! EVERYTHING'S UNDER CONTROL!



MEET "Mr. Nibroc", the huge new paper machine at Brown Company's Berlin, N. H., mill. Keeping "Mr. Nibroc's" complicated functions under control is a job taken in stride by the Taylor Instruments on the panel above left. They're actually handling the control of 3 vital functions of the machine—all essential to uniform paper quality, maximum production and "Mr. Nibroc's" efficient operation.

1. Roll Pressures. Accurate records of the nip pressures at these five important points on the machine: **(1) couch, (2) first press, (3) second press, (4) pressure roll on Yankee felt squeeze roll, (5) calender rolls,** permit their close control. Results — Maximum water removal capacity at wet end; a sheet more uniform in formation, finish, density and opacity; longer felt life by eliminating uneven frictional wear; lower drying costs per ton.

2. Steam pressure control. Steam supply is accurately and automatically controlled at both Yankee and crepe setting dryers. With these two important variables under control, the desired quality of machine glazing and creping is relatively simple to obtain.

3. Moisture control. Ideal moisture content in finished sheet is closely controlled by a "Stamm" moisture control system using (a) Taylor Controllers and Valves, and (b) Taylor Differential Controllers. Results—Correct pressure differential is maintained in all sections of dryer steam supply header; steam supply is accurately controlled in response to moisture variations.

May we help you? Ask your Taylor Field Engineer! Or write Taylor Instrument Companies, Rochester, N. Y., or Toronto, Canada. *Instruments for indicating, recording or controlling temperature, pressure, humidity, flow and liquid level.*

Taylor Instruments
MEAN
ACCURACY FIRST
IN HOME AND INDUSTRY

Pulpwood drive. Boom being towed across lake.

Pulpwood conveyor and softwood pile. Pulpwood in foreground is floating in pond near the Burgess Mill.

Tractor and sulky hauling full-length logs for sawing at loading area.

thickness is obtained. The mandrels, which are now covered with the wet tubes, are carried by automatic conveyors through a hot chamber, where the tubes are dried to the proper degree, before the mandrels are pulled out by another automatic machine. The tubes are then transferred to hot chambers where they move along slowly, being constantly rotated to insure a perfectly cylindrical shape.

Some of the tubes, while still wet, are removed from the production line and bent to form bends and fittings. These are then dried in a special oven.

The tubes are completely dry when they reach the end of the drying chambers. They are then removed and stacked on small trucks from which they are placed in carriers which are in turn placed in the treating chambers. These chambers are large autoclaves which after being filled with tubes are tightly closed and evacuated. The molten pitch is then admitted to the chamber and forced into the fibrous network of the tube bodies. After the treatment is complete the carriers are removed from the chambers and the excess pitch is allowed to drain off.

When the treated tubes have cooled and the pitch has set, the ends are trimmed off by saws and the edges are then cut on a special lathe. This operation shapes the edge so that it may receive and hold a coupling that will connect it to the next length of tube when the installation is made. The couplings are made from tubes that are made to the proper diameter and then cut and shaped inside to fit the ends of the regular tubes.

The tubes are made in diameters of 2, 3, 4, 4½, 5, and 6 inches I.D. and other sizes, in between, for couplings. The length of each tube when made is about 100 inches. The standard finished length is 96 inches for straight tubes and 60 inches for curved sections. Many types of special convecters and fittings are also manufactured.

The demand for Bermico Conduit and sewer pipe is rapidly and steadily expanding. Experience has shown that for underground use, when not subjected to any appreciable hydrostatic pressures, Fibre Conduit, sewer pipe and septic tank soil pipe will not only outlast other types but are completely free from root penetration and tuberulation and also attacks by insects and fungi.

In addition to the Conduit and sewer pipe, Bermico returnable paper cores and textile cores are made from similar fibre tubes which are impregnated with special saturants. The paper cores are usually impregnated with one of these saturants and have notched metal ends.

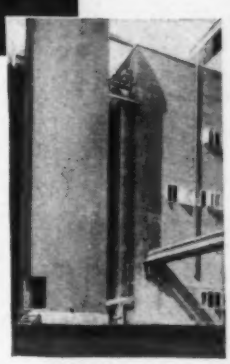
Burgess Kraft Mill

When Brown Company Management decided to build the new kraft mill and paper machine, the Manufacturing

LINK-BELT

Conveyors Handle Chips and Salt Cake for New Kraft Mill at Brown Company

Link-Belt horizontal and inclined belt conveyor carrying chips from storage building to kraft mill housing digestors.



L-B screw conveyor draws salt cake from bin, which is raised by L-B bucket elevator to top of building where a second L-B screw conveyor takes it to processing system.

Smooth, efficient handling which is a large factor in profitable operation, is exemplified at Brown Company's new Berlin, N. H. Kraft Mill, by the Link-Belt conveying machinery shown here. Wood chips are fed from bins to belt conveyors by Link-Belt rotary feeders, driven by Link-Belt Silverlink roller chain drives. Link-Belt troughing idlers with outer rolls at 45 degrees provide high carrying capacity. The 36 in. belt, at 400 ft. per min. carries 15,240 cu. feet of chips per hour.

The view above, showing hard wood chip bin, 15 feeders and belt conveyor, is duplicated for soft wood chips storage bin.

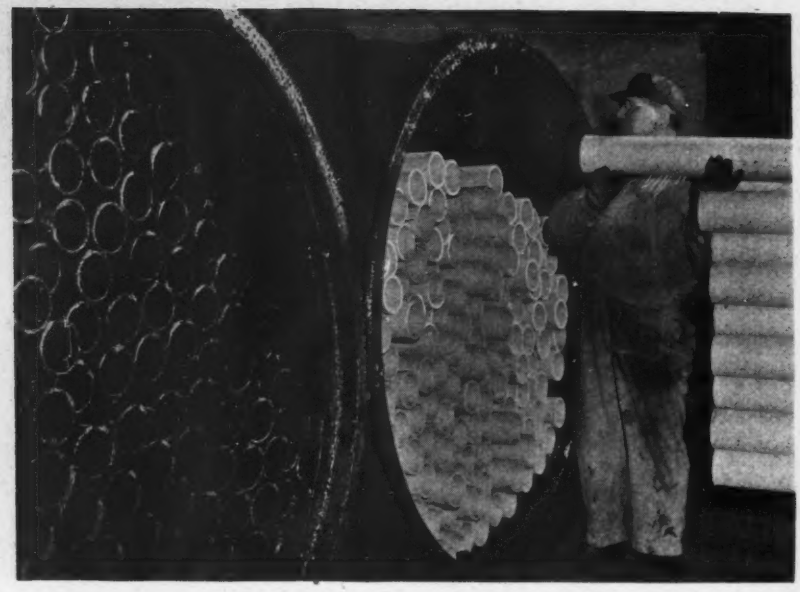
L-B screw conveyors and a bucket elevator, carry salt cake from storage to processing.

LINK-BELT COMPANY

Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Dallas 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8.
Offices, Factory Branch Stores and Distributors in Principal Cities. 11.162

LINK-BELT

CONVEYING MACHINERY

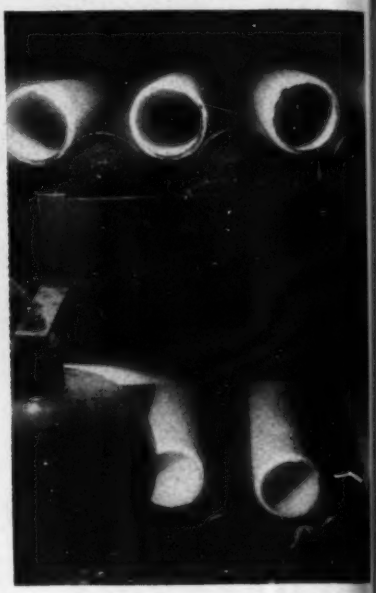


Treated tubes at left. Treater at right being loaded.

Department, the Research and Development Department, and the Engineering Department, together with O. C. Schoenwerk, consulting engineer of Chicago, made detailed studies of the most modern methods in use throughout the country. Consequently, this pulp mill and paper machine include the most modern and practical features possible at the time of construction.

Behind the development of this integrated project are such men as F. G. Coburn, president of the company; Wentworth Brown, vice president in charge of manufacturing; Ernest H. Maling, vice president in charge of finance and accounts, and treasurer; D. P. Brown, vice president in charge of sales; E. E. Morris, works manager; George A. Day, research and development director, and C. A. Johnson, chief engineer, all of whom are recognized leaders in their fields.

Detailed engineering and construc-

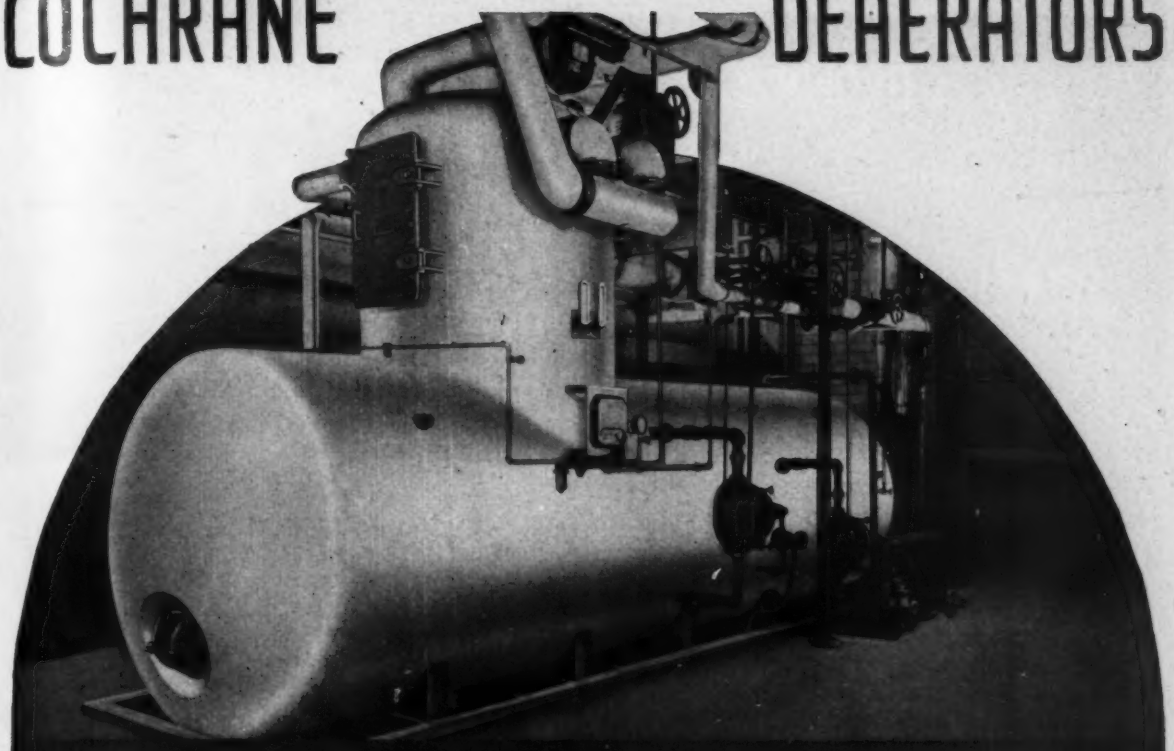


Tubes viewed through glass windows enclosing hot section of tube dryer.

Weighing While Conveying with the Weightometer
At The Brown Company

MERRICK SCALE COMPANY
PASSAIC, NEW JERSEY

COCHRANE DEAERATORS



Oxygen-free feed water at Brown Company's Cascade Steam Plant

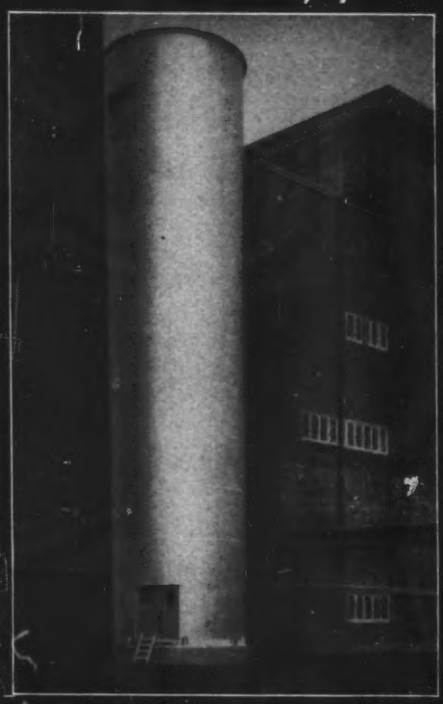
IN steam plants of Brown Company's Mills at Berlin, N. H., Cochrane equipment is protecting modern boilers against corrosion, boiler carry-over, etc. Two Cochrane Deaerators are installed, one at the Cascade Paper Mill boiler plant and one at the new Kraft Pulp Mill recovery boiler installation, to remove excess oxygen from the feedwater. A Cochrane Continuous Blowoff System keeps boiler concentrations uniform and Cochrane Multiport Relief Valves, Cochrane Exhaust Heads and Cochrane Drainers assist in keeping the boiler plant operating at top efficiency. Literature on Deaerators, Continuous Blowoff Systems, Relief Valves, Drainers and Exhaust Heads may be obtained by addressing Cochrane Corporation, 3103 N. 17th St., Philadelphia 32, Pa.

COCHRANE

85 YEARS OF SERVICE 1863-1948

Hats off to the **BROWN** *Company*

on an Outstanding Job··



Salt cake silo by Lancaster Iron Works in The Brown Company's new plant.

··and a Slight Boost for Ourselves!

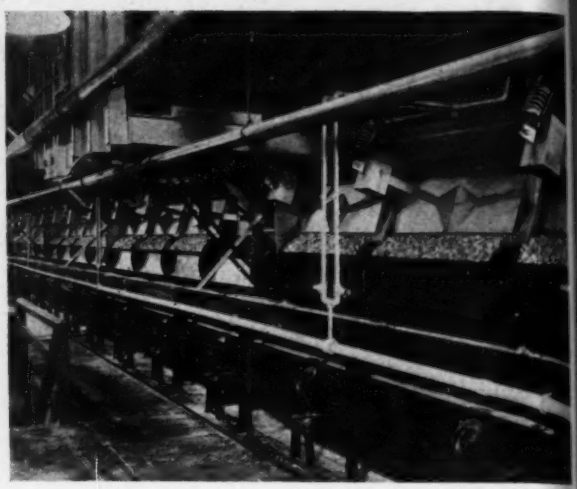
LANCASTER IRON WORKS equipment in The Brown Company's new plant:

3 Filtrate Tanks for Washer	2 Measuring Tanks
1 Weak Black Liquor Tank	4 Open Top Tanks
1 Clean Hot Water Tank	1 Welded Steel Tank
1 Regulating Tank	1 Foam Tank
1 #1 Strong Black Liquor Tank	1 Salt Cake Silo
1 #2 Strong Black Liquor Tank	

New York Office: GRAYBAR BUILDING

LANCASTER IRON WORKS, INC.

LANCASTER, PENNA.... U. S. A.



The Star feeder drops chips from bins to belt conveyor at controlled rate.

tion of the new mill and machine was handled by the Rust Engineering Company of Pittsburgh, Pa.

In designing the integrated project, the company made use of as much of its present facilities as possible. An example of this is wood handling. The same facilities serve both the new kraft mill and the older sulphite mill.

Power and steam and other services which have been supplied to the sulphite mill also are being utilized in the sulphate mill.

Four welded digesters, furnished by General American, are used in the new mill. Standing 48 feet high and with a diameter of 11 feet, 2 inches, they have a 3,800 cubic foot capacity and are designed for 125 pounds pressure. They are equipped with Fibre Making process bottom screens and are arranged for direct or indirect cooking. Complete instrumentation with automatic controls on liquor measuring tanks, cooking cycle, inert gas relief, etc., has been provided by Foxboro.

One of the most unusual systems in the new kraft mill is the method of handling chips. This system is somewhat different than the former method of storing chips in bins above the digesters and loading by gravity. With the new system, the chips are stored in huge bins above the sulphite mill. These bins are capable of holding 1100 cords of pulpwood in chip form.

As the chips are needed to fill a digester they are mechanically removed from the bottom of the bins and trans-

RIGHT—Chip conveyor and kraft digester loader at top of digester building.

WE ARE PROUD to have collaborated with the Brown Company in carrying out their program of expansion. The new paper machine "MISTER NIBROC" at Berlin, New Hampshire is a Rice-Barton product from Fourdrinier to Winder.

Against a background of over a century of paper machine design every detail has been studied and the result is a paper machine tailored precisely to fit the Brown Company's requirements.

RICE BARTON CORPORATION

WORCESTER, MASSACHUSETTS

WEST COAST REPRESENTATIVE

RAY SMYTHE, 501 PARK BUILDING, PORTLAND, OREGON

Kraft digester loading floor. Foxboro control panel at right.

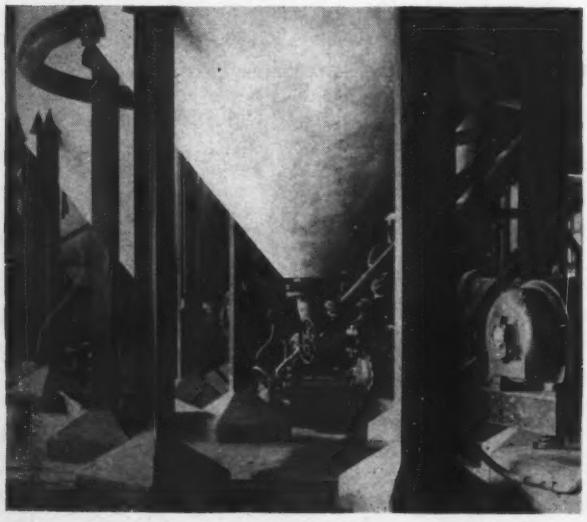
ferred to a high speed conveyor belt which carries them to a loading device above the digester. This automatic chip loader is on a steel track so that it may be moved from one digester to another as needed. This equipment was provided by Link-Belt Company.

To provide uniform digester loadings and consequently help to produce more uniform quality of pulp, every charge of chips is weighed accurately on a Merrick Weightometer. This apparatus weighs the chips as they are being conveyed to the digester. This is accomplished by means of an ingenious mechanism which multiplies the two varying quantities of conveyor load and conveyor belt speed and automatically totalizes the products. The resultant weight is shown on the totalizer dial and may also be registered on other places by remote control. The machine may also be arranged to deliver a predetermined quantity and then automatically stop the flow.

The digesters discharge into two blow tanks, 60 feet high, overall, and 26 feet in diameter. Dilution is controlled automatically by a Foxboro controller. Heat from the blow steam is recovered in a Rosenbladt heat recovery system.

From the digesters, the pulp moves to a three-cylinder vacuum washer supplied by the Oliver Filter Company. This has been designed to operate on either hardwood or softwood pulps. Jonsson screens ahead of the washers remove all knots or uncooked chips, which greatly improves the washing efficiency. Washed pulp is stored at high density in six large concrete tanks, 65 feet high and 30 feet inside diameter. The tanks provide 600 tons of storage at 7% consistency, which is an important advantage in supplying the various pulps to the paper mill.

Pulp is pumped from the storage through automatically controlled equipment to flat screens, which were a part of the original sulphite mill equipment. The arrangement and capacity of these screens is such that exceptionally clean stock is obtained.



Kraft digester bottoms showing circulation lines and blow valves.

After screening, the stock is thickened and delivered to a pumping chest, where consistency is controlled by a Brammer regulator, and then pumped by low lift pumps to the pipelines leading to the paper mill, nearly two miles down river.

The liquor that is washed from the pulp is sent to a six-body, quintuple effect evaporator, furnished by General American. Here the black liquor is concentrated from 15 per cent solids to 55 per cent solids for combustion in the recovery furnace. The unit is designed with equal heating surface in each of the six bodies. A vacuum of 26 inches is used in the fifth effect, obtained by use of a barometric condenser equipped with a steam jet ejector. Heat is supplied by steam at 35 pounds pressure.

The unit is designed to give an economy of 4.04 pounds of evaporate per pound of steam furnished. Six tangential inlets and centrifugal type separators give entrainment losses below 0.1 per cent of the total solids fed to each body.

Black liquor pumps are of high alloy steel, while carbon steel tubes are provided in all but the first two effects, where stainless steel is used. Liquor deflectors in the first effect vapor bodies are 20 per cent stainless clad on the impingement side. The lower part of the two vapor bodies of the first effect are lined with stainless alloy No. 304. The tube sheet in the first two heating elements is of 20 per cent stainless clad.

Like other units, the evaporator system is completely instrumented and its operation is principally automatic.

The recovery furnace was supplied by the Combustion Engineering Company and is designed to burn 680,000 pounds of black liquor solids in 24 hours. Steam is generated at 450 pounds pressure. The recovery boiler generates about 100,000 pounds of steam per hour. A cascade disc evaporator is used for final concentration of the black liquor.

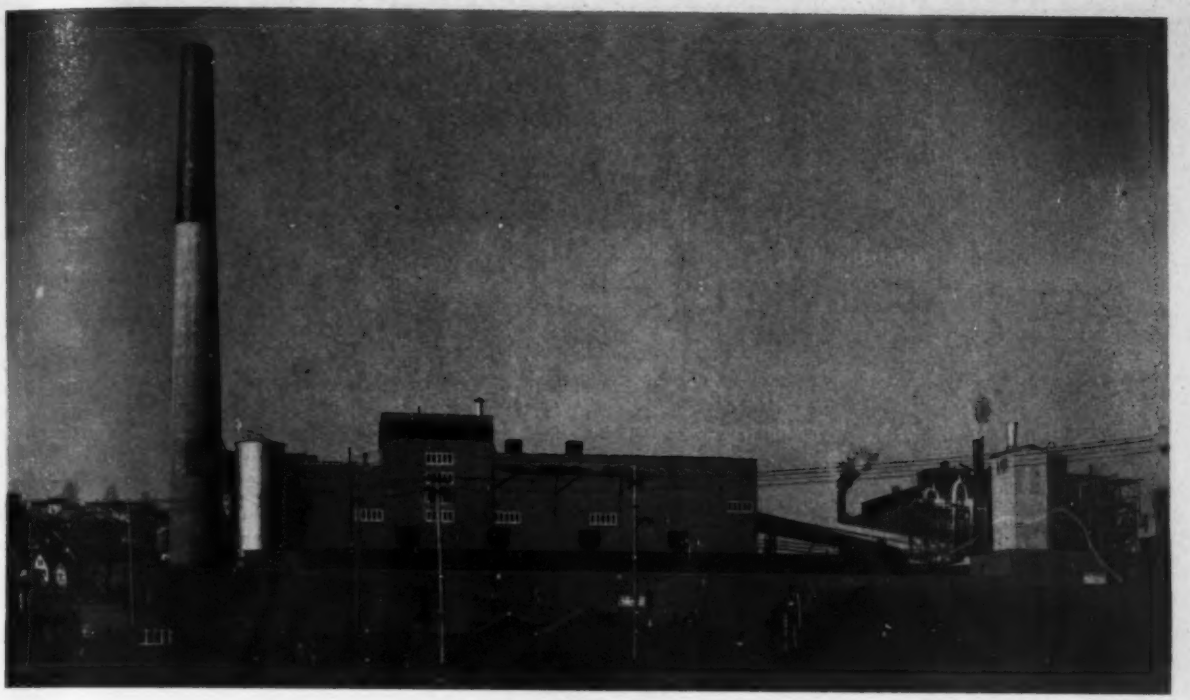
An electric precipitator, built by the Research Corporation, thoroughly cleans the flue gases and recovers entrained salt cake before they go up a 250-foot acid-proof lined concrete stack.

The causticizing equipment, supplied by General American, provides complete facilities for slaking, causticizing, green liquor clarification and lime recovery.

Unclarified green liquor flows continuously to a regulating tank, from which it is pumped to a three-compartment clarifier and then to a green liquor storage.

The dregs from the clarifier are pumped to a three-compartment counter-current dregs washer.

Clarified green liquor is pumped through a Rosenbladt spiral heat exchanger with automatic flow control to



Pulp Mill at Burgess Plant

Complete new pulp and paper facilities at Brown Company's Burgess and Cascade Plants were designed and built by

THE RUST ENGINEERING CO.

Industrial Design & Construction—Since 1905

PITTSBURGH, PA.

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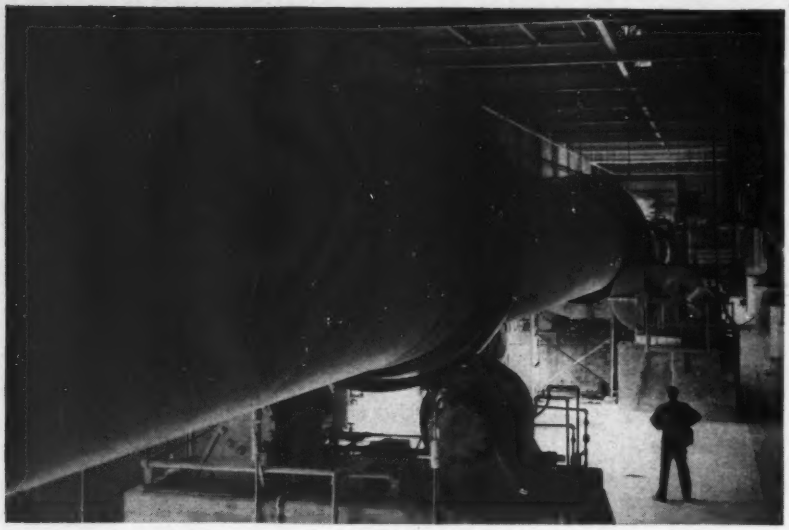
Interior of Stock Preparation & Paper Machine Room at Cascade Plant



The 250-foot lime kiln. Looking toward discharge end.

a rotary type slaker, seven feet in diameter by 30 feet long.

Lime is fed continuously to the slaker through a Ross feeder and the Slurry discharged from the slaker flows to a screw classifier. Now free of large particles of unslaked lime or other impurities, the slurry moves to three causticizing or reaction tanks equipped with turbo-agitators. From the tanks it flows by gravity to the 30-foot diameter by 20-foot high three-compartment clarifier.

Clarified white liquor is pumped to storage and the lime mud is pumped to a mud washing clarifier, a duplicate of the strong white liquor clarifier.

All traces of soda are washed out by a Conkey filter and the lime mud, at about 50 per cent moisture content, is fed by a screw conveyor to the lime kiln.

Heart of the lime recovery system is a rotary kiln supplied by General American, seven feet in diameter and 250 feet long, rated at 70 tons of CaO per 24 hours. The feed end for a distance of 40 feet is equipped with heat recuperative chains. The kiln is fired with fuel oil using a Hauck burner.

Equipment includes four 14-inch tires of floating design and eight water-cooled supporting trunnions.

The lubrication system is new to lime kiln design. The Bowser forced feed lubrication with heat exchangers and strainers is used. Cooling of the lubricating oil is possible when the kiln is running hot under normal conditions.

The lime kiln is driven by a 40 horsepower, variable speed DC motor. The unit is completely equipped with panel board and instruments, including a carbon dioxide indicator, draft indicators at four points, oil temperature and pressure gauges, oil tank level and temperature recorders, automatic six-point temperature recorder and alarm signals on bearings and thrust bearings.

The lime lost in process is replaced by adding crushed limestone to the kiln, with the sludge, by means of a Ross feeder. Stack gasses are passed through a wet scrubber, which completely removes all lime dust so that only clean flue gas and water capor are vented to the atmosphere. The reclaimed lime is conveyed to storage bins where it is ready for use in recausticizing the cooking liquor.

The new kraft pulp mill and the Cascade paper mill are connected by three parallel pipelines, each 11,000 feet long.

Two woodlined pipes, each 16 inches in diameter, receive the washed and screened pulp in slush form from the kraft mill. The pulp moves by gravity flow following the grade of the river to the Cascade Mill.

The third pipeline, 22 inches in diameter, carries fresh water from the Burgess water filter plant to the paper mill.

New Paper Mill

When the pulp enters the Cascade Mill it is thickened to proper consistency for use in the stock preparation system by two Oliver thickeners. After passing through a Dezurik consistency regulator, it is dropped into either one of two tanks, depending on its grade, either softwood or hardwood. Each tank holds 17.5 tons at 5 percent consistency.

Four emergency receiving tanks are provided in case of failure of the thickeners or other equipment. These tanks will take the entire volume in the stock lines at its 1 to 1½ per cent consistency.

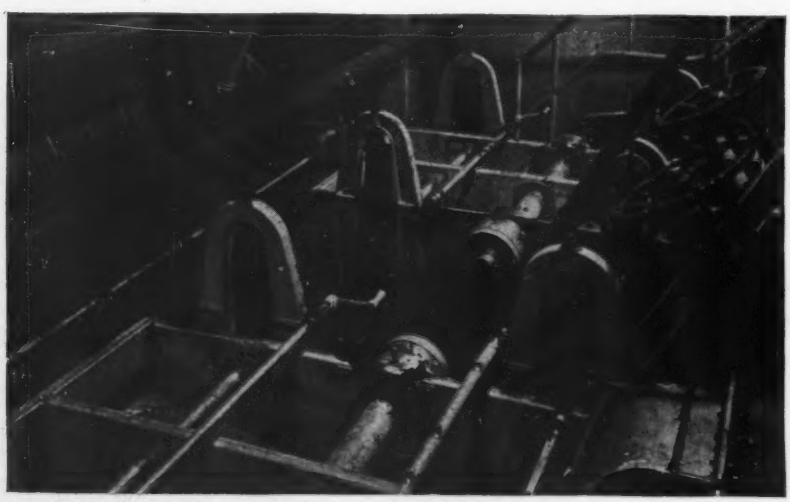
Provision is also made for pumping to additional storage in seven sulphite digesters, formerly used in the Cascade Sulphite Pulp Mill. Each has an eight-ton capacity at about 8% consistency.

The emergency and receiving tanks are tile lined with the receiving tanks having Noble and Wood propellor type agitation to keep the stock in movement at its 4.5 or 5 per cent consistency.

From these tanks, the stock is pumped to slush tanks that supply the new paper machine. The stock then is supplied to two cylindrical conical-bottom cycling tanks, where pre-hydration is given it to the degree desired by means of a Dilts hydrafiner.

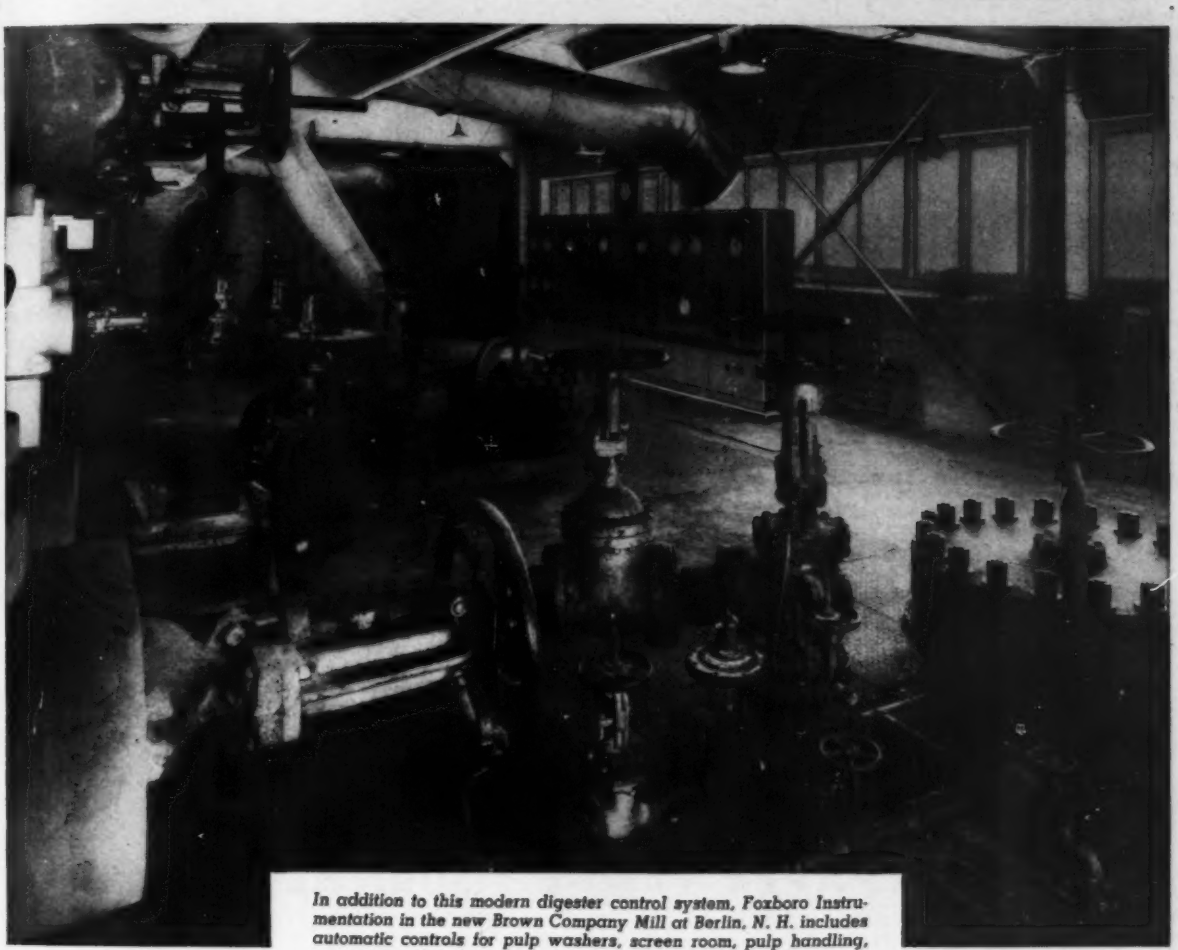
It is drawn to a 20-foot Dilts hydrapulper, where the furnish to the paper machine is completed in the proportions of hardwood, softwood, groundwood or other fibres used, as well as the addition of chemicals. Here either slush or baled lap stock may be used.

The entire operation from the time the stock enters the mill is automatically controlled by a single panel push button arrangement supplied by the Foxboro Company. All level recorders are in view of the operator handling



Jonsson screens precede the three stage Oliver washers.

PULPING PROCESSES OF BROWN COMPANY'S NEW KRAFT MILL... *100% Foxboro Controlled*



In addition to this modern digester control system, Foxboro Instrumentation in the new Brown Company Mill at Berlin, N. H. includes automatic controls for pulp washers, screen room, pulp handling, evaporator, dissolving tanks, recausticizing, and lime kiln.

To insure full benefits from the latest methods of operation and types of equipment, modern automatic control systems by Foxboro were selected for this new mill. In design and construction, these systems have been advanced hand-in-hand with the latest manufacturing developments in the pulp and paper industry.

The engineering thoroughness and modern appearance of the digester control system shown above are typical of the other Foxboro systems throughout the mill. This system controls and records all important factors in the digester room: liquor charge to each digester; temperatures (3 points) and pressure of cook; flow, temperature and pressure of steam to digester room; relief condenser temperature; conductivity of heater condensate; blow tank level.

From wood to finished product, modern control systems by Foxboro are making possible new high efficiency in the manufacturing operation of pulp and paper mills. Why not increase the efficiency of your mill by installing similar controls? Contact your Foxboro engineer or write for Bulletin. **The Foxboro Company, 114 Neponset Ave., Foxboro, Mass., U.S.A.**

FOXBORO Engineered CONTROL

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Combustion Engineering Co. spray type recovery furnace.

the operation at all times.

The same holds true in the pulp preparation in the beater room, where the stock is drawn to the cycling tanks. All is controlled by automatic arrangement on one panel under the control of a stock furnisher.

From the hydrapulper, the stock is discharged into an agitated tile-lined machine chest, from where it is pumped to a flow box supplying three Dilts hydrafiners. It is then fed to another flow box supplying two Emerson jordans. There it is given its final treatment for proper degree of hydration.

After the stock leaves the jordans it passes through a Brammer Consistency regulator and a weight control regulator. The regulated stock then flows to the inlet of a 17,000 GPM Warren Centrifugal pump where predetermined dilution is added from the wire pit stock. The diluted stock, which now has a consistency of considerably less than 1%, is pumped to the two Bird screens from where it drops back to the inlet of the fan pump. This pump, which is also a Warren Centrifugal with a capacity of 17,000 GPM, moves

Looking downward at the six-effect General American evaporator.

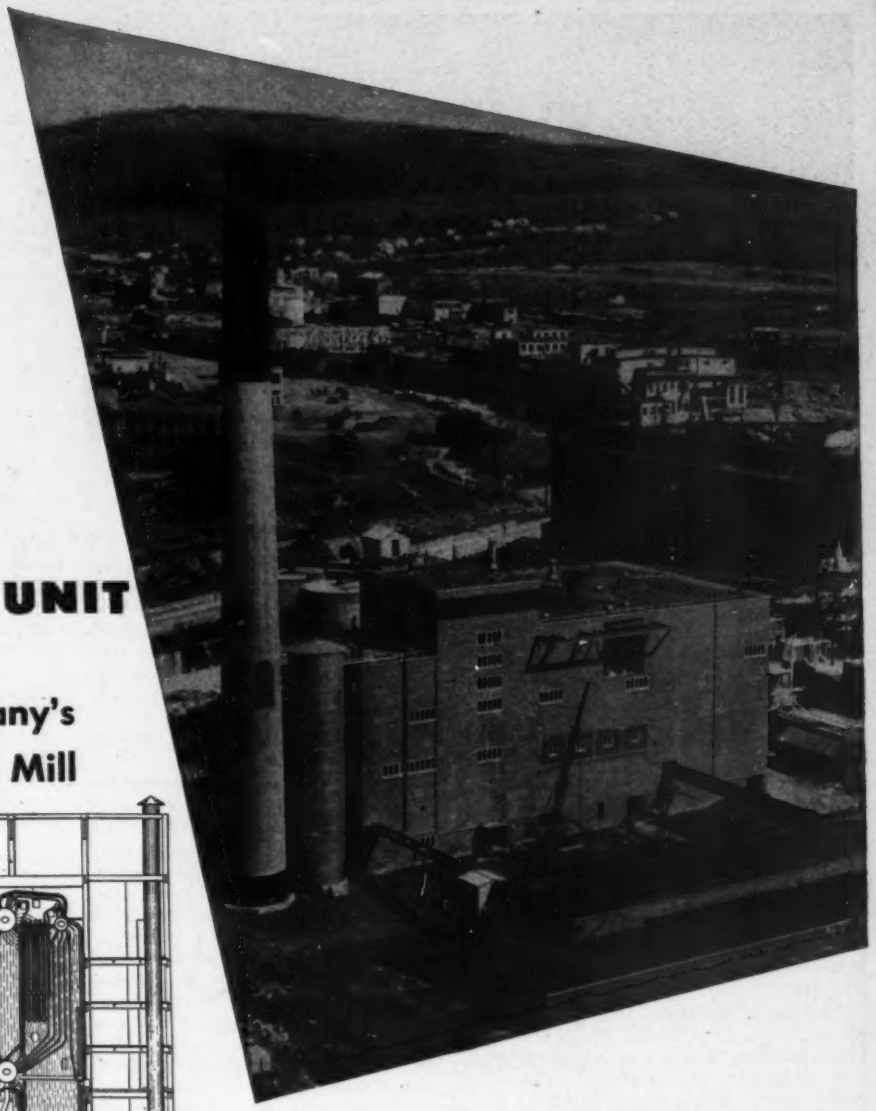
SPECIAL ISSUE DATES

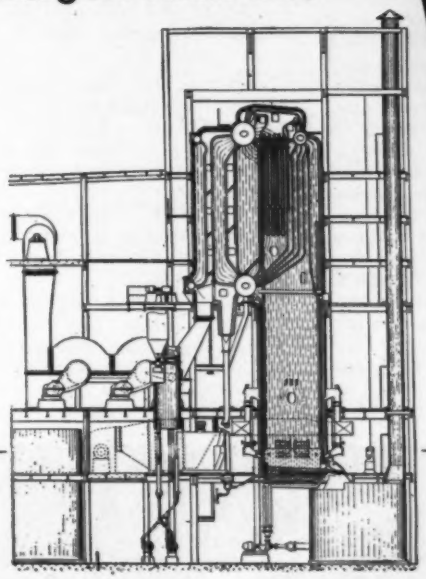
PAPER TRADE JOURNAL

Mill Equipment Number
September 9, 1948

TAPPI Number November 18, 1948

C-E
Supplies
RECOVERY UNIT
for
Brown Company's
Burgess Kraft Mill





The newly opened Burgess Kraft Mill at Berlin, N. H., is one of the most modern on this continent. This is not surprising, for the Brown Company, has been making kraft paper for more than 35 years.

C-E is proud to have furnished the Recovery Unit for this modern plant. The unit itself, pictured above, is designed to handle 680,000 pounds of black liquor solids every day, generating steam at 700 F and 450 psi. A C-E Recovery Unit of similar capacity has been in operation at their La Tuque Mill since 1943.

The reliability, economy and operating efficiency of the C-E Recovery Unit are well known. And, as you would expect, more and more mills are turning to C-E for both new installations and expansion of existing ones.

C-E

COMBUSTION ENGINEERING

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•

C-E PRODUCTS FOR the paper industry include steam generating, fuel burning and related equipment; also many types of pressure vessels.

B-235

Bird screens produce clean stock for "Mr. Nibroc."

the stock up to the paper machine head box.

All piping conveying stock to the head box of the machine throughout the entire pulp preparation system is woodlined or of stainless steel.

The two Bird screens and the Bird Dirtecs are on the machine floor level. This is made possible by the use of the double pumping arrangement and the Beloit valve on the discharge side of the fan pump for static head control at the slice. This is under the control of the machine tender on the operating floor. The head box is completely stainless steel lined and is equipped with a Van De Carr inlet slice.

Water from the white water tank retrieving the Oliver thicker effluent is piped for stock preparation and other mill use.

The paper machine, itself, "Mister Nibroc," is a Rice Barton Yankee type towel machine designed to run at 1200 feet per minute. It consists of a fourdrinier part, non-suction couch and Yankee pick-up, first suction press, second suction press, pressure roll, top felt suction roll, bottom wet felt equipped with wringer rolls, a 12-foot Yankee dryer, pre-set crepe dryer and 25 roll dryer section. The two-roll calender stack has hydraulic loading and the Rice Barton winder system is equipped with a center-line pope reel and unwinder with regenerative motor brake control.

The fourdrinier part consists of a wire which is 196 inches wide and 100 feet long with the latest modern removable features developed by Rice Barton. When changing a wire the fourdrinier assembly rolls into the tending aisle on swing beams located over the pit and then on to removable beams located in the tending aisle. The wire is then draped over the pit from stringing devices that support the wire when the fourdrinier section is moved back into place.

The fourdrinier is equipped with a 30-inch diameter breast roll, and six table rolls of dandy-type construction, 16-inch diameter by 204-inch face, followed by several additional conventional type table rolls of 11-inch diameter, rubber covered. All rolls are dynamically balanced for speeds in excess of 1500 FPM. Five stainless steel suction boxes are equipped with end grain maple covers and have hydraulically motivated crosswise oscillation on a "Z" nickel spring suspension. Suction is supplied by two Nash Hytor Vacuum pumps and two Jennings Pumps remove the water.

The wire pit is of tile-lined construction and under the couch is a pit with propellor type agitation, where the consistency is controlled by an electronic device. Whenever stock is dropped from the couch it is automatically returned to the machine chest. The bottom couch is of the circumferential grooved type, 36-inch diameter, and carries an upper couch roll of 28-inch diameter. The two suction presses are of Beloit design and are of 36-inch diameter with 28-inch rubber-covered top press rolls. The top felt suction roll is not rubber covered.

The pressure roll is of 28-inch diameter, electrically driven. Provision is made for installation of a suction type pressure roll should it be desired.

The Yankee Dryer is of Beloit construction, 144-inch diameter, 203-inch face.

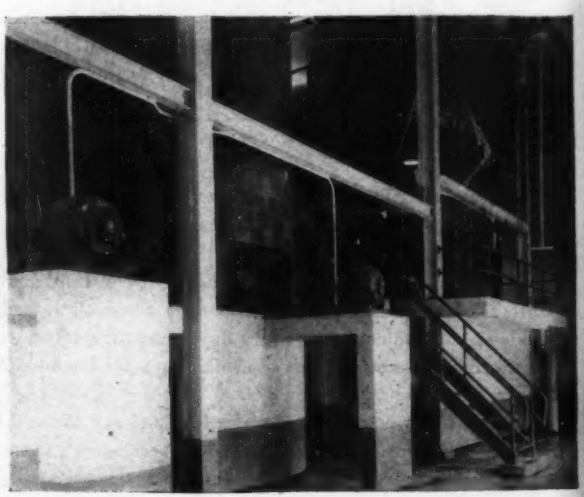
All loading on the presses, pressure rolls, etc. is accomplished hydraulically with Vickers pump arrangement. Felt stretch rolls are motor equipped, being handled from the tending side convenient to the machine operator. The couch raising and lowering device is also hydraulically equipped.

Following the Yankee Dryer there is a 60-inch diameter crepe set dryer, further followed by 25 additional 60-inch diameter by 194-inch face dryers in two sections; the first comprising eight, and the second section having 17 dryers. Five felt dryers are also provided.

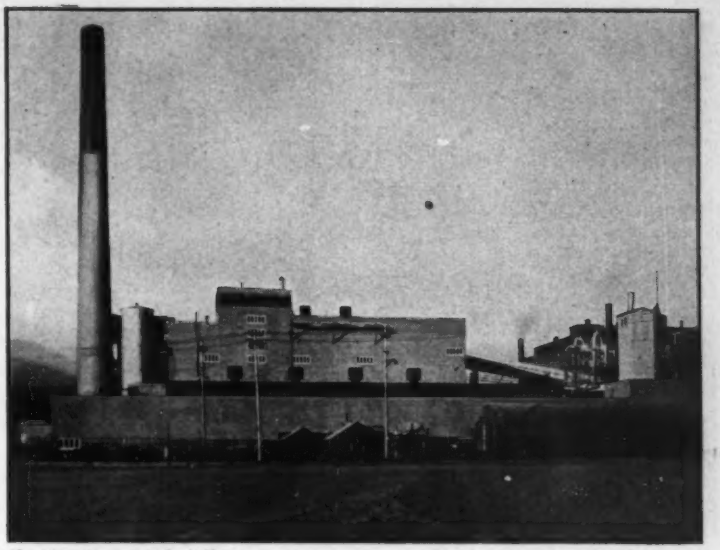
Among the accessories which are so necessary in carrying the tail on a high speed machine are the Sheehan rope carrier which takes the sheet as it enters the first crepe set dryer and conveys it through the dryers, through the calender rolls and to the pope reel, where air devices engage it with the reel spool. This eliminates the human element of handling as conventionally done on a pope reel. The bottom calender roll is of 30-inch diameter, 194-inch face, while the upper roll is of 24-inch diameter, 194-inch face. The upper roll is equipped with hydraulic loading and unloading device and is driven as well as the bottom roll.

From the pope type uniform speed reel, the reel spools are transferred to an unwind drum of 42-inch diameter by 196-inch face equipped with a pair of pivot arms for holding the reel spool bearings. The unwind reel is equipped with regenerative motor that acts as a dynamic brake for producing the desired tension between the unwind reel and the winder.

The winder is of Rice Barton construction, suitable for operation at 4000-feet per minute. The drums are of 22-inch diameter by 190-inch face. A special feature of the drum is outward



Lower level view of Hydrapulper and tile Cyclifiner chests.



The New Burgess Pulp Mill

"MISTER NIBROC" IS ROLLING

Here's a composite portrait of "Mister Nibroc" the new towel machine at Brown Company's Cascade Mill in New Hampshire. From the new Burgess Pulp Mill, a three-mile pipe-line feeds pulp direct to "Mister Nibroc"—the last word in streamlined towel production.

Three years in building, "Mister Nibroc" embodies the most advanced equipment, construction engineering and modern design in the towel-making field. The suppliers and manufacturers who provided their quality products and know-how share Brown Company's pride in a job well done.

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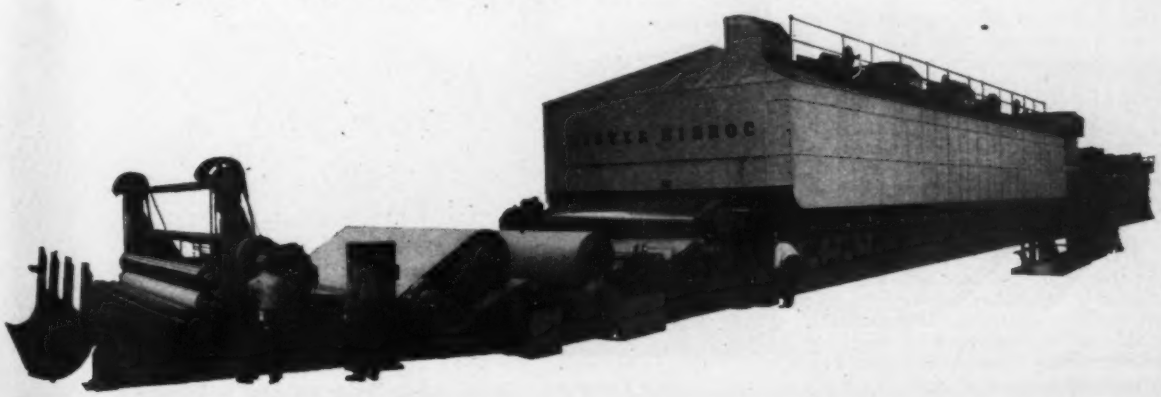
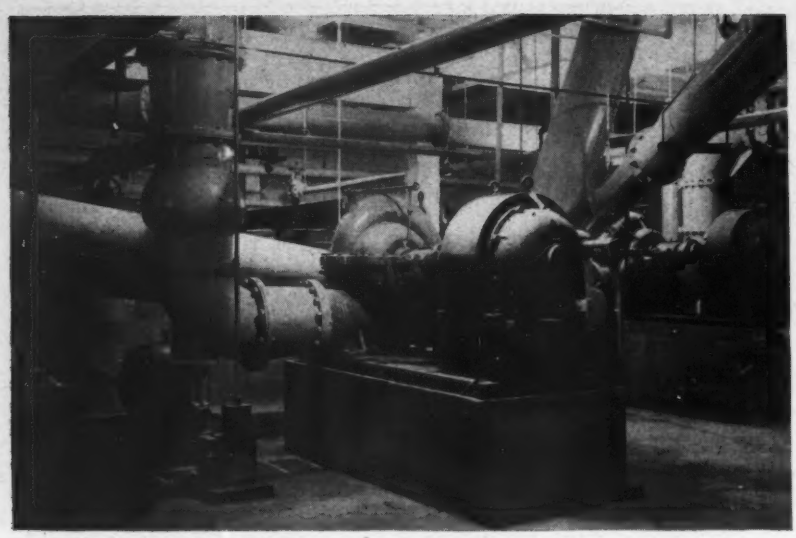




The Warren fan pump has a capacity of 17,000 gallons per minute.

rotation, standing at the front side, eliminating ingoing nip. This prevents any operator from becoming injured by falling into or by getting caught in an ingoing nip, i.e. the rotation of the drums is counter-clockwise rather than the conventional clockwise, standing at the tending side facing the winder.

Slitters are of the top and bottom shear type, and are pneumatically equipped for engagement or disengagement by remote push button control by the operator. Slitters are individually motor driven type.

A floor level dolly track receives the rewind roll from the winder. This is shunted to the towel converting room without further manual effort.

The oil system is of the latest Bowser type for lubrication of bearings, equipped with receiving tank, filters and pressure tank to supply circulating oil to the bearings of all dryers, idler gears, driving pinions, calender rolls and main gears. All dryer gears are enclosed.

The Ross Engineering Corporation's dryer hood and Yankee hood over "Mister Nibroc" is of the latest design and installation equipped with economizer and scrubber attachments for recirculation of air, balanced to room conditions.

The entire machine is driven by the latest Westinghouse sectional electric motor drive, and is designed for speeds up to 1500 feet per minute. The controls are of the latest electronic devices. The entire length of the machine room is traversed with a Northern crane of 20 tons capacity, facilitating changes of machine clothing or removal of parts of the machine for repair.

Supervision and Planning

Operation of the new mill and new machine is being directed by men who have had long experience in their fields. L. M. Cushing, manager of the Pulp Manufacturing Division, has been with Brown Company for 25 years. C. R. P. Cash, general superintendent of the division, came to Berlin from La Tuque, where he served as superintendent. Lamar M. Murray, superintendent of the kraft mill, has had kraft experience with a number of leading mills in this country and Mexico.

Manager of the Paper Manufacturing Division is Walter A. Johnson, who came to Brown from the Middle West, where he had a wide experience in operating paper mills. General superintendent of the division is J. Raymond Almand, who has come to Brown from a large paper corporation, where he held a similar position. Ervin Vickman, a long-experienced operator of paper machines equipped with Yankee dryers, will have direct supervision over "Mister Nibroc."

Behind these supervisors are other men of Brown, many of whom have been making pulp or paper for the company for many years. There are such men as Temple Birt, Archie Belanger and Wilbrod Carrier, causticizing operators, who have been with Brown for more than 34 years, and John Belanger, William Gagnon and Francis Sweeney, digester cooks, who joined the company in 1913, 1915 and 1923, respectively.

There are other men of the company who have contributed much in making possible the building and operation of this integrated project—men such as J. E. Mullaney, project manager and now acting chief engineer; Henry W. Stafford of the Engineering Department, who served as project engineer; Bernard Covieo of Engineering, who directed instrumentation work; Arthur Brosius of the Paper Division; Wilfred Lepage of Engineering, who did considerable work in layouts, particularly of auxiliary equipment pertinent to the paper machine; George Craig, then plant engineer at Cascade, now with the central Engineering Department, and Ernest P. Cook, assistant chief engineer.

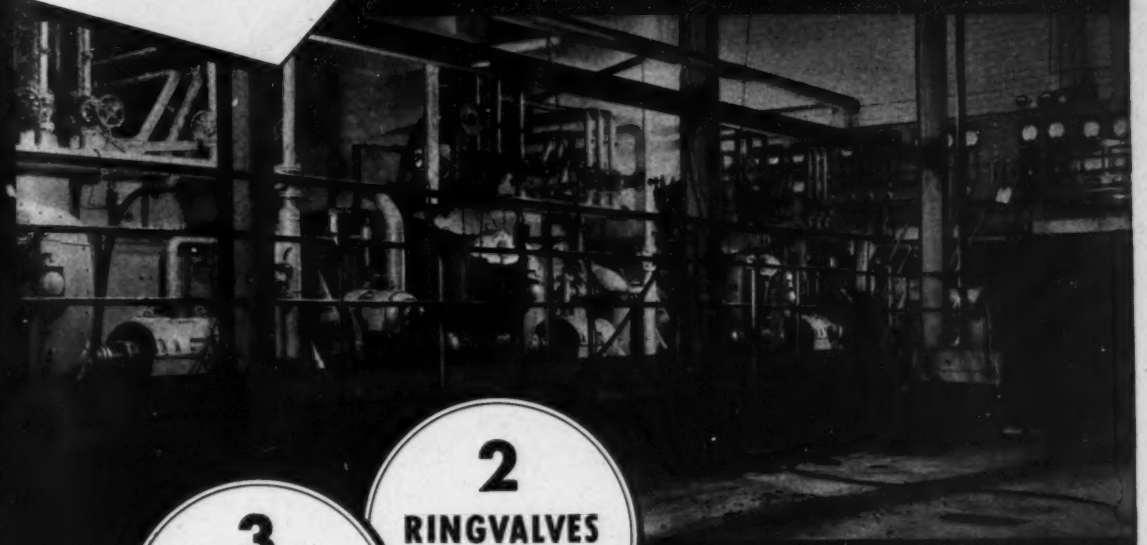
While officials in Berlin have been directing the building of the new project, members of the Sales Department in New York have been preparing for the distribution of the output of "Mister Nibroc" and other increased paper production.

Heading the sales group is D. P. Brown, vice president in charge of sales. Distribution of the company's paper products is directed by G. F. Henderson, manager of the Paper and Towel Sales Division, assisted by H. E. Moley, assistant manager of the Paper Division and W. T. LaRose, assistant manager of the Towel Division. These divisions now give maximum efficiency in distribution of the products which will flow from this modern combination of production facilities.

A major step of modernization has become a reality—a step completed by a team of production, woods, research, sales and financial personnel working in close coordination.

Wet end of "Mr. Nibroc," showing Yankee dryer and suction presses.

OLIVER Ringvalve Filters at Brown Company



3 RINGVALVES handle the KRAFT WASHING

2 RINGVALVES handle the THICKENING

. . . in the NEW 200 Ton SULPHATE MILL of Brown Company

● Brown Company recently started operations in the large mill at Berlin, N. H. which it had converted from sulphite to sulphate. Oliver Ringvalve Filters were installed to handle the brown stock washing and thickening jobs. Handling the 200 tons per day design tonnage, these filters are easily capable of handling up to 250 tons.

The Ringvalve Washers, shown in the picture, are washing counter-currently as a three stage system. The exceptionally high hydraulic capacity of the Ringvalves permits operations with more dilute feed in the vat thus promoting more uniform and better sheet formation which, in turn, results in better washing.

Brown at Berlin is the latest of the new mills to break into production with Oliver Ringvalves. Many are now in service and are making excellent records.

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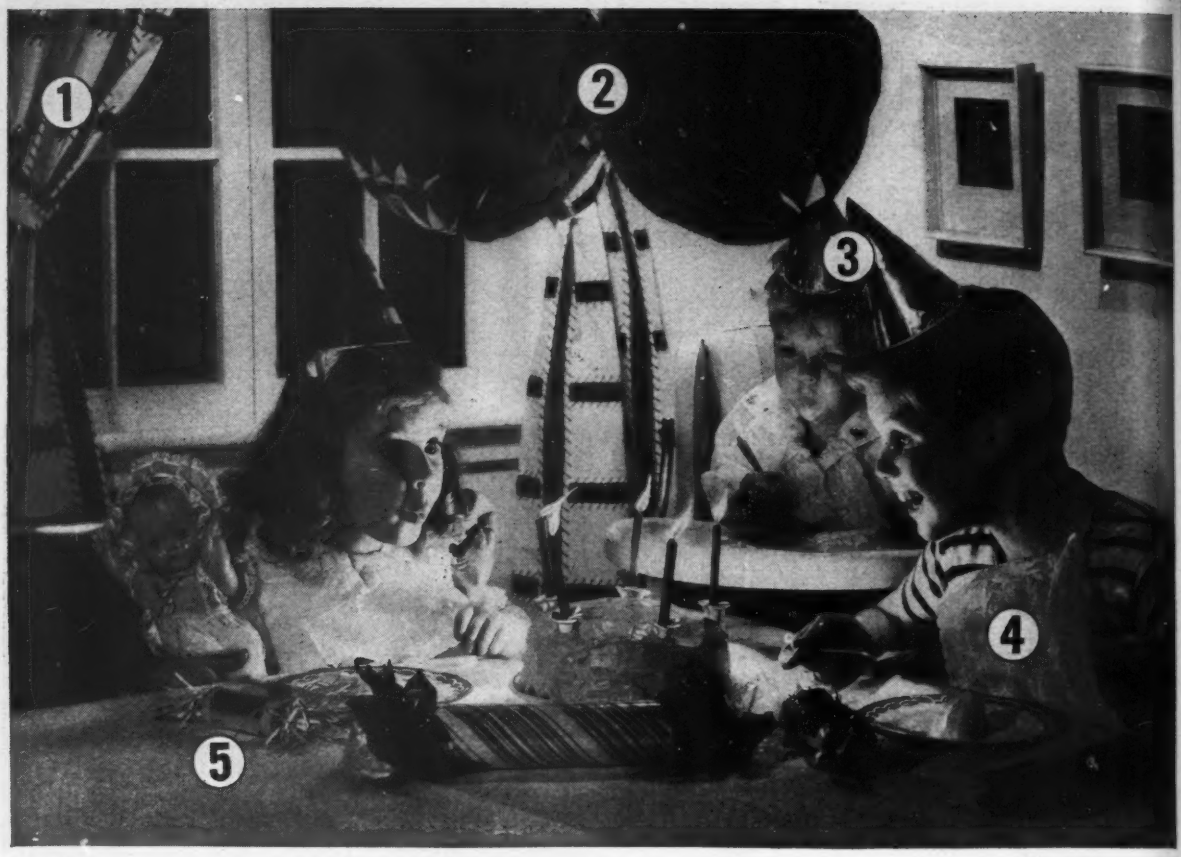

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122 E. 42nd ST., NEW YORK 17, N. Y. Edited By R. G. MACDONALD, Secretary

Basic Principles of Corrosion Control by the Use of Lime*

By Edward S. Hopkins[1]

Abstract

The basic principles showing corrosion of iron and steel water pipe as a function of the dissolved oxygen are reviewed. Neutralization of free carbon dioxide in low alkaline waters by lime and the subsequent precipitation of a calcium carbonate-ferric oxide coating on pipe surfaces retards corrosion to the point of practical elimination. A water so treated is stable when maintained at the calcium carbonate saturation point. Cost of treatment is given and is economical.

It is common knowledge that soft water containing dissolved oxygen and free carbon dioxide corrode iron and steel pipe excessively. In accordance with the electro-chemical theory, oxygen is the direct corroding agent with the rate governed by the reaction between the dissolved oxygen in the water and the film of atomic hydrogen at the surface of the metal *(9)*. It is also known that the hydrogen ion concentration of the water is not a factor in the initial deposit of rust on clean or bright iron surfaces since the rate of deposition is about equal at pH values between 5.0 and 9.0. After the initial rust coating has been deposited, continued corrosion of the metal is in direct proportion to its porosity. The coating deposited on pipe walls from waters containing "aggressive" carbon dioxide is porous while that laid down in alkaline waters, above the calcium carbonate saturation point, is compact and dense *(11)*. This compact coating of iron oxide-calcium carbonate will prevent diffusion of the dissolved oxygen in the water to the metal.

"Aggressive" carbon dioxide was the term employed by Tillmans *(10)* to describe the corrosive action of carbon dioxide dissolved in soft waters having low pH values. Massink and Heymann *(8)* demonstrated that the aggressiveness of the carbon dioxide is regulated by the bicarbonate alkalinity and pH of the water. To measure the corrosiveness of aggressive carbon dioxide bearing waters, von Heyer *(5)* developed the "marble test" now used as standard procedure.

Neutralization of aggressive carbon dioxide by alkali retards cold water corrosion by stoichiometric reaction and by the precipitation of the dense iron oxide-calcium carbonate coating on the pipe surface. It is, therefore, an indirect method of control. Lime or other alkali treatment does not stop corrosion unless the pH value is continually maintained at the calcium carbonate saturation point. The absence of "red water" is not necessarily a criterion of the elimination of corrosion.

The rate of corrosion in pipe lines is a function of the loss in dissolved oxygen from the water after passing through the system. A slight loss may be noted with corrective treatment with appreciable loss when corrosion is occurring. Routine testing for dissolved oxygen is the best method for determining the extent and efficiency of the treatment.

Hot water corrosion in relation to steam generation is not eliminated by this treatment, since the bicarbonate ion is formed by the neutralization of the free carbon dioxide. Upon heating the water to boiling, the bicarbonate ion breaks down to free carbon dioxide and hydroxide frequently producing corrosion in return condensate lines. Localized treatment at the steam generating plant is required to overcome this condition.

Treatment of Very Soft Water

A soft, low alkalinity water, less than 20 p.p.m. hardness, will have slight buffer action and maintenance of

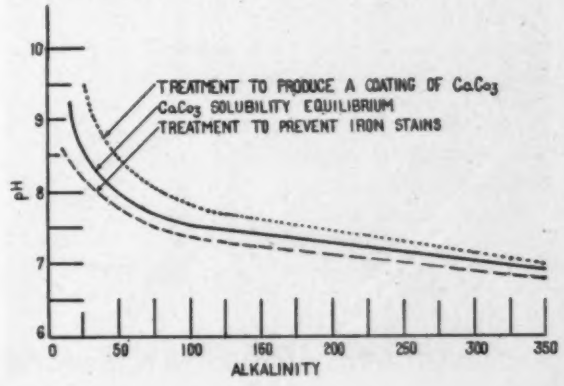

FIG. 1

* Presented at the Annual Meeting of the Technical Association of the Pulp and Paper Industry, Hotel Commodore, New York, N. Y., Feb. 23-26, 1948.

[1] Associate Engineer, Bureau of Water Supply, Department of Public Works, Baltimore, Md.

the calcium carbonate equilibrium will require high pH values and produce caustic alkalinity. This is usually of minor importance to industry but renders a water nonpotable in that it has a slimy taste.

The Catskill water supply for New York City has a normal alkalinity of 8 p.p.m. Hale *(4)* reports that neutralization of the free carbon dioxide in cold water with lime raised the pH value to 9.7 to 9.9; with 10 p.p.m. excess calcium hydroxide the pH was 10.1; with 50 p.p.m. 10.3 to 10.4 and with 100 p.p.m. it was 10.8. After 148 days, black iron pipe, ¾-inch in diameter, was heavily coated by a soft sludge of calcium carbonate. Flow decreased as follows:

Untreated water	55%
Carbon dioxide neutralized	35%
10 p.p.m. excess lime	20%
20 p.p.m. excess lime	15%
30 p.p.m. excess lime	10%
40 p.p.m. excess lime	6%
50 p.p.m. excess lime	8%
100 p.p.m. excess lime	16%

It may be concluded from the above data that lime treatment is not practical for these soft waters without periodically flushing the system. With a gravity flow river water serving an industrial plant, this would not be expensive in relation to the cost of pipe renewal. The introduction of sodium or ammonium sulphate to a very soft water to increase buffer action and lower its pH value for corrosion control is not usually economically advantageous. Unless cheap water is available for flushing, replacement of corroded pipe is the most practical operation.

It is apparent, therefore, that lime treatment to eliminate corrosion is only of value with waters having a hardness greater than 25 p.p.m.

Plant Control

Baylis *(1)* in 1922 initiated pH controlled corrective treatment with lime as a function of water purification, using the Gunpowder river supply at Baltimore, Md.

This water is moderately hard having the following average analysis:

Alkalinity, p.p.m.	35
Soap hardness, p.p.m.	38
Bicarbonates, p.p.m.	43
Sulphates, p.p.m.	7.9
Free carbon dioxide, p.p.m.	6
pH, p.p.m.	7.1

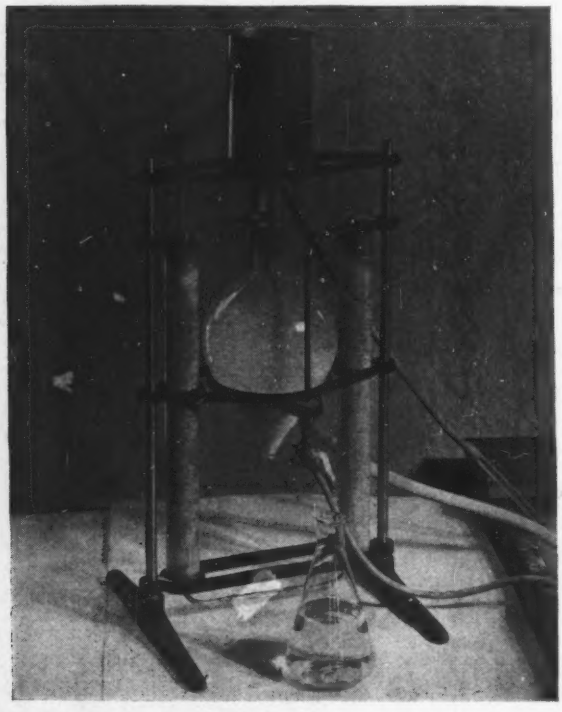

Fig. 2

To facilitate plant operation Baylis *(2)* studied the solubility of calcium carbonate and plotted the "marble test" on a curve showing the saturation point for waters of varying alkalinity (Fig. 1.) This is a practical guide but when applied to hard waters, (200 p.p.m. or above) due to buffer action, it indicates pH values higher than found in actual practice.

Enslow *(3)* developed a "continuous corrosion stability indicator" to keep a constant flowing sample of water at the calcium carbonate saturation point (Fig. 2). This device permits testing of the pH and alkalinity when desired. Usually a 4-hour contact period is given between the powdered calcium carbonate and the raw water. It is excellent for the use with water from a "flashing stream" since changes in buffer characteristics are easily detected by frequent sampling.

The value of corrective treatment with lime or other alkali rests upon the constant maintenance of the hydrogen ion concentration at the calcium carbonate saturation point. It cannot be an intermittent treatment since at any time the water is below this value, aggressive carbon dioxide is present and will redissolve the coating previously precipitated.

Accurate control of the lime dosage and precise pH values are only possible by the use of recording potentiometers. These devices are usually actuated by glass electrodes with ranges in pH from 2.0 to 12.0. (Fig. 3). With daily adjustment to the correct pH value by use of color standards, exact measurement may be contained. The charts used on the potentiometer serve as a permanent record of the pH value of the delivered water (Fig. This equipment is inexpensive and trained technical skill is not required to keep it in good order.

Commercial dry feeders and other appliances are available for the application of lime to a water supply. Either caustic or hydrated lime may be used. Large plants, 100 million gallons per day, find caustic lime the most economical, when continuous automatic slakers are utilized.

Results of Treatment

Once calcium carbonate equilibrium has been established, the water will remain stable and the effect of lime treatment is apparent in pipe lines after a few months. The calcium carbonate solubility point for the Gunpowder river water is at pH 7.8 with an alkalinity of 38 p.p.m. It will be noted from the accompanying table that the pH value of the water is constant after passage through 1200 miles of distribution mains and an open balancing reservoir of 459 million gallons capacity. Since passage through these reservoirs may be considered analogous to a spray pond, it is apparent that corrective treatment with lime has value for industrial use.

The value of protective treatment with lime is illustrated in a recent American Water Works Association committee report *(7)* which states:

"Other factors being equal, the data show marked correlation between pH value of water carried, and rate of capacity loss. Average conditions reported indicating for supplies with a pH value of 6.5 twice the loss observed in supplies with a pH value of 8.0."

Other than causing a slight increase in hardness, corrective treatment with lime does not have a direct effect

Fig. 3

upon steam generation. Boiler water control is an independent function. However, warm water, 70 to 100° F, will be noncorrosive and treatment is a profitable undertaking.

Cost

By stoichiometric reaction, 1 part of carbon dioxide equals 1.275 parts of caustic lime, and 1.903 parts of hydrated lime. Due to the buffer action of various waters, this direct relation does not exist when maintaining the calcium carbonate saturation point. For this reason it is not practical to compute the cost of treatment upon a direct ratio of million gallons of water—p.p.m. carbon dioxide—p.p.m. lime.

Cost of corrective treatment for the Gunpowder river water aeraged $0.431 per million gallons over the past 25 years. This included labor, storage and depreciation. The 1947 cost was $0.359.

Reconciling the 1947 cost to open market purchase in ton lots, bagged, at the mill, it becomes $0.376 per million gallons for caustic lime and $0.634 for hydrated. Obviously these prices will vary with the volume of water used and amount of lime purchased.

Conclusions

There is an extensive investment in iron and steel pipe and it does not seem probable that a metal less corrosive than iron will be developed for large users of water in the near future. Consequently, if there is to be a reduction in corrosion it must be brought about by the treatment of the water or by the use of more durable internal pipe coatings. Water lines are in place and except where they have corroded to the extent they will no longer withstand pressure, it would not be economy to replace them. Even though complete elimination of corrosion may not be accomplished by water treatment, the value of the reduction where the water is fairly corrosive greatly exceeds the cost of treatment. Based upon public water supply experience, it is believed that corrective treatment with lime will produce a water of considerable economic value to many industries *(6)*.

Acknowledgment

Acknowledgment is made of the pertinent review and constructive criticism given by Julian G. Patrick. Certain information used in the paper was obtained from the official records of the Bureau of Water Supply, Department of Public Works, through the courtesy of Paul L. Holland, Director, and Leon Small, Water Engineer.

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TABLE I.—pH OF SAMPLES FROM DISTRIBUTION SYSTEM
(15 Year Average)

	Plant Effluent *	Distribution System 1st Zone **		Plant Effluent *	Distribution System 1st Zone **
January	7.8	7.6	July	7.7	7.7
February	7.8	7.6	August	7.8	7.7
March	7.8	7.7	September	8.1	8.0
April	7.8	7.7	October	8.5	8.2
May	7.8	7.7	November	8.2	8.1
June	7.7	7.7	December	7.7	7.6
Max. month	8.9	8.7			
Min. month	7.0	7.0			
Aver. month	7.9	7.8			

* Sample collected every 2 hours
** Sample collected weekly from twelve stations .

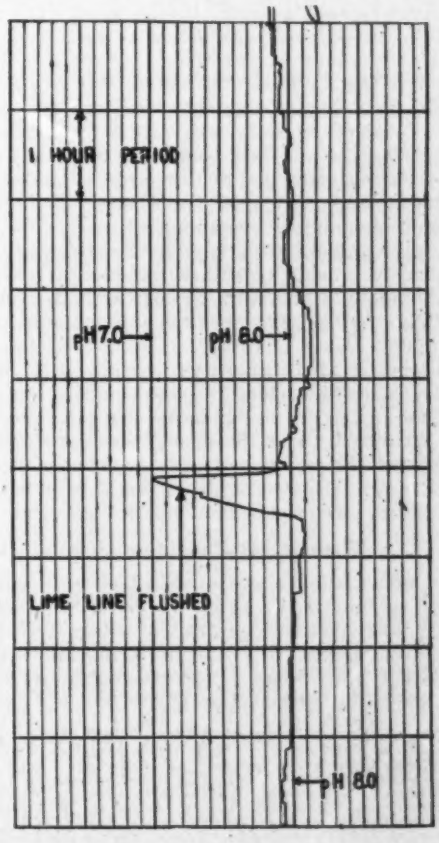


Fig. 4

The Pyrolysis of Ammonium Sulphite Waste Liquor to Yield Ammonia*

By Aaron E. Markham[1], Quintin P. Peniston[2], and Joseph L. McCarthy[3]

Abstract

A method proposed in the literature for the recovery of ammonia from ammonia base sulphite waste liquor has been investigated experimentally. Conditions have been found under which around 90% of the ammonia can be recovered. These conditions include the use of a temperature of around 600°C or over, a humid gas to sweep out the volatile products, and, preferably, a rapid rate of heating. Sulphur is collected in the absorbers in a form that is not directly reusable and may complicate the reuse of the ammonia.

A mechanism for the reactions involved is discussed.

There has been reported in the literature the process of the Norsk Hydro-Elektrisk Kvaelstofaktieselskab *(1)* by means of which the recovery of ammonia and sulphur dioxide from ammonium sulphite waste liquor is said to be possible by carrying out the following process steps: (a) heating at about 150°C for an hour or more ammonium sulphite waste liquor containing about 50% solids to convert the liquor into a solid mass, (b) drying, crushing, and then heating the solid mass in a retort for 15 to 30 minutes at 200 to 470°C while passing nitrogen or air through the mass to carry out the liberated gas. The gas is said to contain sulphur dioxide and ammonia in amounts corresponding to 50 and 95 to 99% respectively, of the sulphur and nitrogen contained in the ammonium sulphite waste liquor processed. Further claims are: that by heating to 600 to 800°C, 70 to 88% of the sulphur dioxide and 99 to 99.7% of the ammonia can be liberated and recovered; that the solid remaining after pyrolysis is in a form similar to coke and contains about 4% of sulphur; and that the process can be carried out over a wide range of temperature, using air or nitrogen, either dry or containing steam.

This process has accordingly been investigated because it appears to provide a method by means of which sulphur dioxide and ammonia, perhaps suitable for reuse in pulping, may be recovered from ammonium sulphite waste liquor.

Preliminary experiments were carried out under conditions duplicating as closely as possible those specified in the patent *(1)*. When it was found that the yield of ammonia recovered under these conditions was much less than claimed, the experiments described below were performed in an effort to find reaction conditions which would permit recovery of ammonia in high yield.

Theoretical Considerations

If ammonia is to be recovered in high yield from ammonium sulphite waste liquor by pyrolysis, then it is essential, first, that the pyrolysis of nitrogen-containing organic compounds proceed to form ammonia and second, that this ammonia be removed from the zone of reaction before it decomposes.

Cleavage of Ammonia

In a previous report *(2)* the authors have shown that 96% of the nitrogen (determined by the Kjeldahl method) present in an ammonium sulphite waste liquor sample was removed onto the resin when the liquor was flowed down through a tower containing a cation exchange resin on the hydrogen cycle. This result, joined with other evidence, indicates that the nitrogen exists largely or entirely associated as ammonium salts with sulphonic acids of lignin, and with other strong acids. Since the lignin sulphonic acids are the major acidic substances present, the main problem may be considered as one of liberation of ammonia from these substances. A possible skeletal structure representing the general type of ammonium lignin sulphonate compounds of concern is given in Fig. 1.

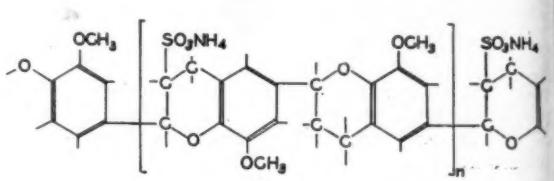
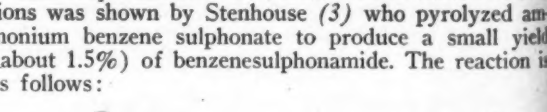


Fig. 1

Possible Skeletal Structure [a] for Ammonium Lignin Sulphonate.

Although there is some evidence *(2)* that during evaporation of ammonium sulphite waste liquor, and subsequent heating of solids as described above, reactions may occur by which some nitrogen compounds other than ammonium salts are formed, acid leaching of such solids over a period of several days has been found to remove 80% of the nitrogen, presumably as ammonium salts. However, after pyrolysis of these solids, only 15% of the nitrogen contained in the residue was removed by acid leaching. The difference in behaviour after pyrolysis may be due in part to a physical change, but probably chemical changes occur as well.

That sulphonamides are formed under similar conditions was shown by Stenhouse *(3)* who pyrolyzed ammonium benzene sulphonate to produce a small yield (about 1.5%) of benzenesulphonamide. The reaction is as follows:



Egli *(4)* also reported that benzenesulphonamide, as well as quinoline, was produced in small amounts during the pyrolysis of ammonium benzene sulphonate. The production of arylsulphonamides by heating the ammonium salts of the corresponding sulphonic acids above 225° has been patented *(5)*.

It seems probable that sulphonamide formation occurs to some extent on heating ammonium lignin sulphonates

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[a] The location of the sulphonic acid grouping at the 3 position in the benzpyrane ring has recently been suggested by Pennington, Olleman, Wright, Evans and Ritter (Science, in press) of these Laboratories.

to give rise to the formation of insoluble lignin residues containing nitrogen and sulphur. Thus as long as ammonium sulphite waste liquor solids contain nitrogen only in the form of ammonium salts, the pyrolysis reaction necessary to liberate ammonia is simply one of breaking an oxygen nitrogen bond. However, to whatever extent other nitrogen compounds may be formed by heating, the ammonia liberation may require different conditions.

Decomposition of Ammonia

After liberation of ammonia from ammonium sulphite waste liquor solids, it must be removed from the hot reaction zone before combustion or thermal dissociation can occur. If pyrolysis is conducted in absence of oxygen direct combustion cannot occur.

$$N_2 + 3H_2 \rightleftarrows 2NH_3$$

However, at 1 atmosphere total pressure ammonia is thermodynamically unstable. Calculations from the results published by Larson and Dodge *(6)*, obtained in their study of the ammonia-nitrogen-hydrogen equilibrium, show that the equilibrium mixture contains 15% of ammonia at 200°C, 1.3% at 325°C, and 0.12% at 500°C. Even less ammonia is present at equilibrium under lower pressures. Since the combined pressure of ammonia, nitrogen, and hydrogen during pyrolysis at atmospheric pressure would be well below 1 atmosphere, it is evident that under the conditions of pyrolysis the equilibrium mixture would contain insignificant amounts of ammonia.

However, the approach toward equilibrium may not be rapid. The rate of the decomposition reaction varies greatly with the nature and magnitude of catalytic surfaces. Data presented by Kunsman *(7)* indicate the order of magnitude of the rate of decomposition on representative surfaces. On a promoted iron oxide catalyst, which caused the most rapid decomposition of those catalysts he investigated, the half life of the ammonia at a pressure of 5 cm of mercury varied from about 1 minute at 380°C to 9 minutes at 230°C. Dilution of the ammonia with an equal volume of hydrogen reduced the rate of decomposition by 50%. The rate varied many thousand fold with different catalytic surfaces, and on one of the surfaces with least catalytic activity was the same at 780° as on the ferric oxide at 360°.

The ash resulting from the pyrolysis of ammonium sulphite waste liquor solids contains considerable quantities of oxides of iron. This ash, as well as the surfaces of a retort, may to some extent catalyze ammonia decomposition. However, the retort surfaces may be made relatively small and the gases produced in the pyrolysis need not be in prolonged contact with them.

From these considerations, no serious decomposition of ammonia was expected at moderate temperatues as long as the products of pyrolysis were rapidly swept out of the hot region by a continuous stream of gas.

This expectation was strengthened by the experience of Monkhouse and Cobb *(8)* who were able to convert the nitrogen in coke almost quantitatively into ammonia by prolonged heating (100 to 200 hours) in a stream of steam or wet nitrogen. Destruction of ammonia was serious only when the nitrogen used for sweeping it out was not humidified.

Experimental

Preparation of Sulphite Waste Liquor Solids

The ammonium sulphite waste liquor used in most of the experiments was prepared by pulping hemlock chips in ammonium bisulphite solution, using a 50-liter stainless steel rotary autoclave in the Chemical Engineering Laboratories of the University of Washington. The resulting sulphite waste liquor was subjected to steam stripping and was then evaporated under vacuum to a concentration in total solids of over 50% *(2)*. The concentrated liquid was converted to a solid, as needed, by heating under pressure for an hour at 150°C *(1)*. The black solid so produced readily air dried to a brittle mass which was easily crushed to any size desired for the pyrolysis. Solids from two such sulphite waste liquor preparations (I and II) were prepared.

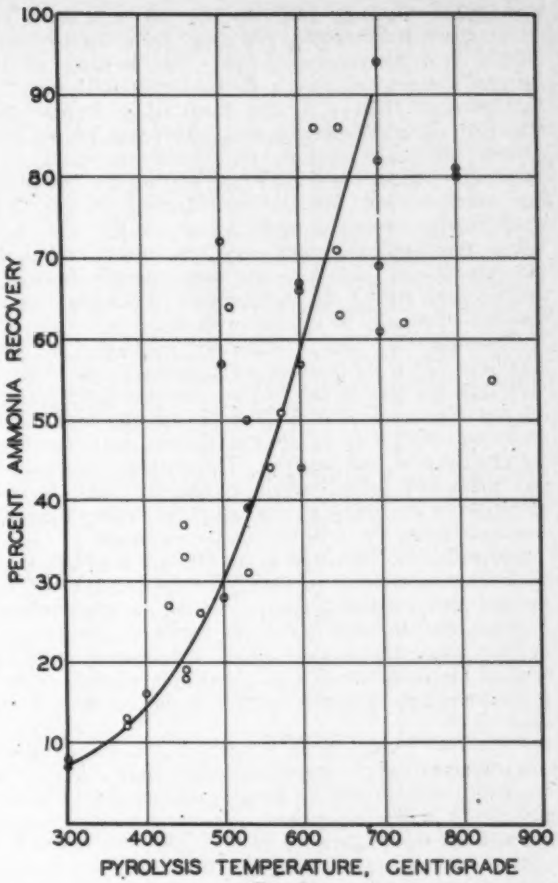

Fig. 2
Ammonia Recovery as a Function of Pyrolysis Temperature

To provide the larger amounts of sulphite waste liquor solids used in the later experiments, a quantity of commercial ammonium sulphite waste liquor was obtained. This liquor was evaporated to dryness at atmospheric pressure to produce solids (III). The analysis of these solids on an air dry basis is shown in Table I.

TABLE I.—NITROGEN AND SULPHUR CONTENT OF SULPHITE WASTE LIQUOR SOLIDS

Sample	Kjeldahl Nitrogen, %	Sulphur, %
I	3.50	7.53
II	1.48	...
III	3.18	6.53

Apparatus

The apparatus used in each of the pyrolysis experiments consisted of a retort or its equivalent for the pyrolysis, with auxiliary heaters, humidifiers, condensers, and absorbers. Several different retorts were used as follows:

Apparatus I consisted of a 25-mm. diameter glass combustion tube lying horizontally in an electrically heated tube furnace. The sample was placed in a porcelain boat or glass tube which was inserted in the combustion tube. Gas was either forced through the tube by running water into a connected gas-containing bottle, or

was drawn through the tube by an aspirator. The temperature was roughly indicated by a thermocouple located just above the sample. The heating of the furnace was regulated by a Variac autotransformer.

Apparatus II was in the form of a Pyrex glass retort of about 50 ml. capacity, which was heated by a molten salt bath (sodium and potassium nitrates in eutoctic mixture). A small tube entering the bottom of the retort served for the introduction of gas. The temperatures observed were those of the salt bath. When this apparatus was used, the retort containing the sample was placed in the bath, already heated to the temperature of the experiment. Thus the sample was heated rapidly to its final temperature.

Apparatus III was a vertically positioned 12 inch length of 0.75 inch diameter stainless steel tube, with an inlet tube for gas at the bottom, and an outlet tube at the top. The cover was held on by a flared fitting. The retort was heated in an electric furnace used for heating crucibles in coal analysis. The furnace temperature was measured by a built-in pyrometer. The furnace temperature was found to read about 80° higher than that observed inside the retort by a thermocouple.

Apparatus IV consisted of an 800-ml. Kjeldahl flask, heated by an electric furnace. The temperature of the furnace was regulated with a Variac autotransformer. A glass tube, through which the solids or concentrated sulphite waste liquor were added, was inserted into the neck of the flask which was closed by a rubber stopper. A thermocouple reached nearly to the bottom of the flask.

Apparatus V was made for larger scale experiments and consisted of a cylindrical steel shell, lined with refractory which formed a combustion chamber 30 inches high and 4 inches in diameter. A sheet steel stack superimposed on this chamber was provided with means for adding fuel and for stirring the fuel bed, and had an outlet for the combustion gases. A grate at the bottom of the combustion chamber supported the fuel bed. Steam, gas, or air could be introduced through tubes entering below the grate. A large vacuum pump drew air through the apparatus.

Absorbers; A system of condensers and absorbers was used with each retort to remove the ammonia from the gas stream. A glass water-cooled condenser first cooled the gas and condensed most of the water. A loose filter of glass wool following the condenser removed most of the tar. The gas was then washed by bubbling it through several absorbers containing dilute hydrochloric acid.

Precedures for Pyrolysis

The procedures used in the operation of the different retorts differed only in details. With apparatus I through IV the sample size varied from 4 to 10 grams of solids. In general, the weighed sample of sulphite waste liquor solids, (through 10-mesh screen) was put into the retort and heated, while air or nitrogen was passed through the retort. This gas rate was closely controlled and was measured, when possible, by means of a wet test meter. The air or nitrogen was sometimes used without humidification, but more often was humidified by passing it through a flask of water maintained at a temperature near the boiling point. After the sample had been heated for the desired length of time, the heating and gas flow were stopped, the absorbers were disconnected, and the condensate and absorbent were combined and sampled for analysis. The solid residue from the retort was weighed and analyzed for nitrogen.

In the operation of apparatus I, the sulphite waste liquor solids were put into the cold combustion tube, and the temperature raised over a period of about an hour or more to the maximum value, where it was held for the desired period. For reasons to be explained later this slow heating seemed undesirable, and the other pieces of apparatus were planned to eliminate it. In the operation of apparatus II, the sample was put into the cold retort, the air stream started, and the retort dipped into the hot salt bath.

Apparatus III was at first operated in a similar manner, the cold retort, containing the sample, being put into the hot furnace. Later, a different method was used, in which the sample was wrapped in cellophane and suspended by a thread in the top of the retort above the part that was heated. The retort was then set into the furnace and heated. When it had come to furnace temperature, the sample was dropped to the bottom, came in contact with the hot metal surface, and thus was heated rapidly.

In the operation of apparatus IV the solid (or liquid) sample was fed slowly into the heated retort through a glass tube, while wet air was drawn through the retort.

Apparatus V was of a much larger size, and was designed to pyrolyze from 100 to 1,000 grams of sulphite waste liquor solids at one time. It was first operated as a gas producer; the solids were put into the combustion chamber, ignited, and gasified by drawing a stream of humid air through the burning mass.

In later experiments this apparatus was also operated much as was apparatus IV. The bottom of the combustion chamber was filled with coke, which was started burning. The sulphite waste liquor solids were then dropped slowly onto this hot fuel bed, while air was drawn through. The solids were also fed in the same way onto a hot surface of quartz lumps, the quartz being kept hot by a gas flame.

Several sources of difficulty and error, inherent in the small scale experiments reported here, should be mentioned. Water usually condensed from the humid gas stream in the cooler portions of the combustion tube or retort. There was frequent breakage as this water ran into the pyrolysis zone, and products were lost as the liquid dried and was baked onto surfaces of intermediate temperature. The addition of sample to the retorts at a high temperature almost invariably resulted in some losses of solids which adhered to the tube used for the addition, or which were carried out of the retort into the absorber. Volatile products occasionally escaped through the sample addition tube or the air inlet tube as a result of rapid expansion. Solids remaining after the pyrolysis could not always be removed quantitatively from the retort for weighing and analysis.

These losses were kept to a minimum by every available means. However, in consideration of the size of sample used (usually from 4 to 10 grams), the losses may in a number of the experiments account for a significant part of the nitrogen not otherwise accounted for. As a consequence, the values reported for ammonia recovered should be regarded as minimum values.

Analytical Methods

The products of the pyrolysis were the solid residue and the material condensed and absorbed in the absorbers. These products were analyzed for nitrogen by the usual Kjeldahl procedure *(9)*. The nitrogen present as ammonium salts in the absorbent was also determined by treating an aliquot part of the absorbent with alkali and distilling the liberated ammonia into a volume of standard acid, which was back titrated with alkali. The nitrogen found by this latter method included all volatile nitrogen bases which might be present. Thus methylamine, if present, would be included as ammonia. There are probably no more than small amounts of such bases present, and their bisulphites

included in small amounts in pulping liquor, might be expected to have action similar to ammonium bisulphite. Hence, the result of this analysis is considered to represent the nitrogen available for pulping liquor preparation. As a result of comparative analyses on the absorbents from many of the early experiments, it was found that this figure for nitrogen was always the same as the Kjeldahl figure within 1 to 3%. The two results are thus identical within the experimental error, and in later experiments only the Kjeldahl nitrogen was determined. Most of the results reported here are those of Kjeldahl nitrogen.

All results were calculated to a basis of nitrogen.

Total sulphur was determined in the products of pyrolysis in several of the experiments. The method used was a modification by Yorston, *(10)*, of the A.S.T.M. method for determining sulphur in rubber.

Discussion

The conditions under which the several experiments were carried out, and the results secured, are given in Tables II to VI.

The first experiments (Table II) were intended to duplicate the conditions described as being satisfactory for ammonia recovery, *(1)*. At first temperatures of around 450° were used in apparatus 1, but when the yields of ammonia were found to correspond to only about 35 or 40% of the nitrogen present in the sample, the temperature of reaction was increased. When the use of higher temperatures (expts. 3 and 4), and the use of steam (expts. 5 and 6), failed to improve the yield, apparatus II was constructed, in which it was hoped that better control over several variables could be achieved. The temperature control for apparatus I in the combustion tube was difficult; efforts to humidify the air resulted in frequent tube breakage and it appeared desirable to heat the solids more rapidly.

Apparatus II could be operated only at relatively low temperatures. However, the experiments in which temperature alone was varied showed definitely that the recovery of ammonia was improved at higher temperatures. (expts. 11-13, 14-16).

The application of a vacuum to the retort in experiments doubled the ammonia recovery, but the figure was still low. There was some evidence that most of the ammonia liberation occurred in the first few minutes of the pyrolysis. To confirm this point, the absorbers were changed after each hour of pyrolysis in experiment 17. The results, given in Table VII with those of a similar later experiment, show that very little ammonia was liberated after the first hour.

It was evident at this point that a higher temperature was desirable for the pyrolysis. It appeared that rapid heating might also be desirable, since ammonia liberation was more rapid in .the beginning of the process Apparatus III was built to obtain conditions which would test those points.

The ammonia recoveries obtained in the experiments using this apparatus were much better than any obtained before. The high temperature seemed to be the major factor in the higher recovery. In several cases (expts. 23 and 24), the gas used for sweeping out the products was not humidified. The lower yields in these experiments indicate the necessity for using humidified gas. The rapid heating appeared also to be an important factor. In order to increase still further the rate of heating, the sample was wrapped in cellophane and suspended in the top of the retort until the retort was at furnace temperature, at which time it was released (expts. 27-33). The yields in these experiments were consistently higher, and confirm the belief that rapid heating is desirable.

TABLE II.—CONDITIONS OF PYROLYSIS AND RESULTS, USING APPARATUS I *

Experiment No.	Temperature, °C.	Gas	Gas Rate, liters/hour	Time of Pyrolysis, hours	Weight of Residue, % of sample	Residue Comp., % N	N Recovered, %	N in Residue, %	N not Accounted For, %
1	450	N_2	...	3.5	50	3.40	35	59	6
2	460	Air	65	5.0	3	1.56	34	1	65
3	990	Air	48	1.2	..	...	34	1	65
4	1070	N_2	100	2.3	39	1.73	43	19	38
5[a]	450	Steam	220	1.0	..	4.48	37	58	5
6	450	Steam	220	2.0	53	4.39	33	66	1
7	600	Humid air	15	0.75	22	3.53	44	22	34
8	700	Humid air	20	2.0	2	...	82	1	17
9[b]	600	Humid air	17	2.0	..	...	67	1	32
10[b]	700	Humid air	15	1.0	..	...	69	0	31

* SWL I, in granular form, used throughout except as noted. Gas not humidified except as noted.
[a] Sample in the form of concentrated solution.
[b] SWL solids III used.

TABLE III.—CONDITIONS OF PYROLYSIS AND RESULTS, USING APPARATUS II *

Experiment Number	Temperature, °C.	Gas	Weight of Residue, % of sample	Residue Composition, % N	N Recovered, %	N in Residue, %	N Not Accounted For, %
11	300	N_2	46	2.59	7	80	13
12	375	N_2	41	2.84	13	79	8
13	450	N_2	48	2.86	18	73	9
14	300	Air	47	2.72	8	85	7
15	375	Air	40	2 99	12	81	7
16	450	Air	37	2.87	19	71	10
17[a]	450	N_2	43	3.89	36	48	16
18[a]	450	N_2	43	4.16	38	52	10

* SWL II, in granular form, with humidified gas flowing at 1 liter per hour for a pyrolysis time of 2 hours, except as noted.
[a] SWL I, finely powdered; dry gas used flowing at 5 liters per hour for 3 hours under partial vacuum (4 to 6 cm. mercury absolute pressure).

TABLE IV.—CONDITIONS OF PYROLYSIS AND RESULTS, USING APPARATUS III *

Experiment Number	Temperature, °C.	Gas	Weight of Residue, % of sample	Residue Composition, % N	N Recovered, %	N in Residue, %	N Not Accounted For, %
19	500	Air	7	...	72	..	..
20[a]	560	N_2	49	3.72	44	52	4
21[a]	730	N_2	30	2.02	62	17	21
22[a]	840	N_2	14	1.23	55	5	40
23[a]	500[c]	N_2	46	3.81	38	50	12
24	620	Air	29	3.66	30	31	39
25[b]	510	Air	9	3.04	64	7	29
26	650	Air	0	...	63	0	37
27	500[c]	N_2	43	3.15	57	38	5
28	670	N_2	10	2.12	86	6	8
29	650[c]	Air	0	...	71	0	29
30	650[c]	Air	8	1.90	86	5	9
31[b]	700[c]	N_2	0	...	94	0	6
32	800[c]	Air	0	...	81	0	19
33[b]	800[c]	Air	0	...	80	0	20

* SWL I used throughout as fine powder, except as noted. Gas rate, from 5 to 10 liters per hour. Duration of each experiment, 2 hours. Gas humidified excetp in expts. 23 and 24. Samples in expts. 27 to 33 were wrapped in cellophane. Sample in expt. 26 added as liquid.
[a] Sample in granular form.
[b] Sample dampened to form a paste.
[c] Temperature measured in furnace, probably up to 80° too high.

TABLE V.—CONDITIONS OF PYROLYSIS AND RESULTS, USING APPARATUS IV

Experiment Number	Temperature, °C.	Weight of Residue, % of sample	Residue Composition, % N	N Recovered, %	N in Residue, %	N Not Accounted For, %
34	400	44	5.44	16	71	13
35	430	45	4.49	27	59	14
36	470	39	4.88	26	56	18
37	500	42	4.62	28	57	15
38[a]	530	34	4.61	31	46	23
39	530	30	4.60	39	41	20
40	575	24	4.19	51	29	20
41	600	4	3.71	68	5	29
42[b]	530	43	3.42	50	38	12
43[b]	600	31	2.88	57	23	20
44[c]	700	2	...	61	..	39

* SWL I used throughout, in solution containing 60% total solids, except as noted. Wet air flowing through retort at 3 to 8 liters per hour, for 2 hours, except as noted.
[a] Time, 1.3 hours.
[b] Solid sample in granular form used.
[c] Time, 2.5 hours; solid fed in granular form; air rate, 35 liters per hour.

TABLE VI.—CONDITIONS OF PYROLYSIS AND RESULTS, USING APPARATUS V*

Experiment Number	Time, hours	N Recovered, %	N in Residue, %	N Not Accounted For, %
45	7	13	1	86
46	7	23	11	66
47	0.4	31	0	69
48	0.4	18	0	82
49	0.4	45	0	55
50	0.75	36	0	64
51	0.7	52	0	48

* SWL III in granular form used throughout, with humid air flowing through the retort. The apparatus was used as a gas producer in expts. 45-46. The SWL solids were dropped on a hot coke bed in expts. 47-49, and on a hot quartz bed in expts. 50-51.

TABLE VII.—RECOVERY OF NITROGEN AND SULPHUR AFTER VARIOUS PERIODS OF PYROLYSIS

Time of Pyrolysis, hours	Experiment 17	Experiment 44	
	Nitrogen Recovered, cumulative %	Nitrogen Recovered, cumulative %	Sulphur Recovered, cumulative %
0.08	...	43.2	38.5
0.16	...	46.4	40.5
0.33	...	49.5	42.3
1.00	34.0	56.4	45.0
2.00	34.7	60.2	47.5
2.50	...	61.0	48.0
3.00	36.0	...	...
Total	36.0	61.0	48.0

However, in these latter experiments other factors as well may have contributed to the higher recovery, e.g. the confinement of the sample which prevented it from being blown out of the retort.

That rapid heating is not a necessity in the recovery is shown by the results of experiments 7 to 10, undertaken later, which gave moderately satisfactory yields of ammonia. In these experiments, the solids were heated to the final temperature over a period of 2 hours. Rapid heating expedites the process and may result in improved recovery, but high recovery can be obtained without it.

Apparatus IV was constructed to permit the use of larger samples and also of liquid samples. The results obtained by its use confirm the necessity of a high temperature. They also show that concentrated sulphite waste liquor can be put directly in the retort with results equal to those obtained by the use of solids.

In Fig. 2 the ammonia recovery, in each experiment using humidified gas, is plotted against the temperature of prolysis. The general correlation is evident.

The course of the ammonia liberation with time was followed in experiment 44 (Table VII).

Here again it is shown that the major portion of the total ammonia yield was liberated almost as soon as the solids were brought to pyrolysis temperature. (In this experiment a substantial amount of gas escaped through the sample tube and air inlet tube.)

The course of the sulphur liberation was also followed in this experiment, and results are given in Table VII. The values recorded are those of total sulphur.

Apparatus V was built to make possible the pyrolysis of larger samples and to investigate several methods of operation that might be adaptable to large scale application. Operation of this apparatus as a gas producer resulted in the destruction of most of the nitrogen. When the solids were dropped on a bed of incandescent coke (expts. 47-49), the recovery was somewhat better. Dropping the solids on lumps of quartz heated by gas (expts. 50-41) resulted in a yield slightly better but still unsatisfactory. The recovery in these latter experiments was complicated by the impossibility of maintaining high temperature and high humidity simultaneously in the sulphite waste liquor solids. The active combustion evidently burned most of the ammonia.

The gas resulting from the pyrolysis thus contains ammonia but it also has potential value as a fuel, and as a source of sulphur for reuse in the sulphite pulping process. The fuel value has not been determined but on numerous occasions it has been observed that the gas is readily combustible. The sulphur content of the gas has already been indicated in Table VII, but the different forms of sulphur have not been determined separately. Hydrogen sulphide was usually present, as manifested by its odor and by means of lead acetate test paper. Sulphur dioxide also was probably present. These two compounds could be expected to react in aqueous solution to produce elementary sulphur and perhaps other sulphur compounds. Almost invariably a white colloid, evidently free sulphur, appeared in the absorbent. There was usually an excess of hydrogen sulphide, and probably no sulphur dioxide was ordinarily present in the absorbent. Thus as it is recovered, the sulphur does not appear to be amenable to direct reuse in the sulphite pulping process.

From the experimental results obtained and from information found in the literature on the decomposition of ammonium benzene sulphonate, it seems probable that the most rapid reaction of ammonium sulphite waste liquor solids when heated to a high temperature is simple splitting of the salt to free ammonia and other volatile products. Simultaneously there is some dehydration to form sulphonamide and other nitrogen compounds. These side reactions predominate at low temperature and are favored by slow heating. The nitrogen in such compounds is still recoverable as ammonia, but only by prolonged heating in a humid atmosphere. From the fact that the solid products of the pyrolysis almost always contain a higher percentage of nitrogen than the raw feed, it must be concluded that the solids as a whole are volatilized by the water gas reaction at least as fast as the nitrogen. Perhaps reduction of the sulphur to mercaptide is an essential step in the pyrolysis, as a result of which ammonia is liberated simultaneously with the reduction or immediately thereafter.

Conclusions

Ammonium sulphite waste liquor solids can be pyrolyzed to yield ammonia equivalent to about 90% or more of the nitrogen originally present in the solids. A temperature of about 600°C or more is necessary to complete the pyrolysis in a reasonable time. Satisfactory recovery can be achieved only by nearly complete gasification of the solids. The gas is combustible but of unknown heating value. The atmosphere around the solids during pyroylsis must be humidified. When the waste liquor is fed as concentrated solution to the pyrolysis retort, the yield of ammonia is about equal to the yield obtained by the use of dried solids. Rapid heating of the solids is desirable since it evidently results in more rapid pyrolysis, but it is not necessary. Although a considerable part of the sulphur is recoverable by the pyrolysis, it is in a form which is not readily available for reuse.

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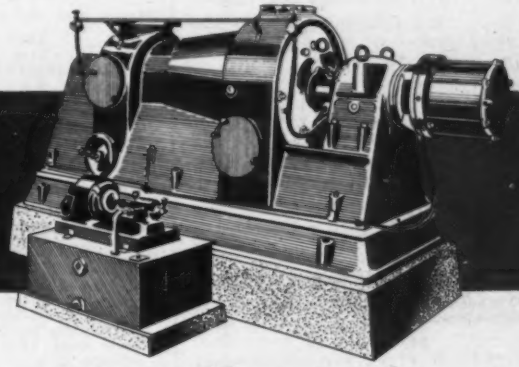

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1—Worthington Monoblock—250 g.p.m.—130' head—direct connected to 15 h.p.—3500 r.p.m.—220/440 volts, totally enclosed, ball bearing motor.
1—New Gould's Pump—75 g.p.m.—70' head—2 x 1½—for motor drive.
2—New Gould's Pumps—150 g.p.m.—60' head—3 x 2—for motor drive.
1—New Gould's Pump—500 g.p.m.—60' head—8 x 4—for motor drive.
1—Ingersoll Rand—60 g.p.m.—210' head—direct connected 7½ h.p.—220-440 volt—3 phase—60 cycle totally enclosed motor.
1—New Warren—all bronze, 30 g.p.m.—60' head—connected to 1½ h.p.—440 volt motor.
2—Ingersoll Rand 100 g.p.m.—75' head—connected to 5 h.p. motor—220/440 volt motor.
1—Worthington—2000 g.p.m.—250' head.
1—Worthington 3 x 4—300 g.p.m. 75' head—1750 r.p.m. Ball bearing for motor drive.

PUMPS—OPEN IMPELLER
1—Frederick fully open impeller—2700 g.p.m., 47' head—12" suction—10" discharge—belt drives.
1—Frederick fully open impeller—1350 g.p.m., 61' head—12" suction—8" discharge—belt drives.
1—American fully open impeller—15" suction—10" discharge—motor drives.
1—Open Impeller—Bronze—1000 g.p.m., 80' head—with extended base and couplings. Ball bearing.
1—Morris Vertical Open Impeller 6 x 6—300 g.p.m. 3 percent stock—50' head—connected to G.E. 15 h. p. 220-440 volt 3 phase—60 cycle—1165 r.p.m.
1—Morris Vertical Open Impeller 8 x 10 500 g.p.m. 3 percent stock—50' head—connected to G.E. 25 h.p.—220-440 volt—3 phase—60 cycle—1165 r.p.m.
1—Frederick Open Impeller—6 x 10 for motor drive. No base.
5—New Goulds 8" suction—4" discharge.
5—New Goulds 8" suction—6" discharge.
8—New Goulds 3" suction—3" discharge.

ROTARY KNIFE CUTTERS
4—New Sprout Waldron Rag Cutters Type F-11. 30" knives.

REDUCERS
1—Jones Worm MAAG Vertical Reducer. Ratio 248 to 1. Serial #208681.
1—De Laval Parallel—65 h.p.—ratio 2.24 to 1.
1—Cleveland 1 h.p. Size 50-A-T. Ratio 40 to 1. with starter and automatic control.
1—Falk 3 h.p. 11.9 - 1
1—Falk 5 h.p. 32.4 - 1

REFINERS
1—New Sprout Waldron type 36 with 200 h.p. Westinghouse 440 volt motor.

ROLLS
9—Brass 240" face x 9¾" diameter. 12½" journals
75—Steel—160" face x 9" diameter.
200 Assorted felt carrying.
50—Brass Chromium Plated. Ball Bearing. 60" Base x 12" Diameter

ROTARY COOKER
1—6' x 20' Rotary Cooker—rebuilt

ROTARY SCREENS
2—Leitzwalk Rotary Screens.
3—Jones Leitzwalk—cylinder 84" face x 28" diameter.
1—#2 Bird Rotary

SCREW PRESSES
2—Valley Voith Screw Presses Size 2A, with new spare sets of plates.

SHEETERS
1—90" Finley 12 roll backstand with layboy Two Pile.
1—136" Hamblet Duplex.
1—184" Hamblet, single knife.
1—122" Dillon Duplex Sheeter. Heavy Duty.
1—Hamblet 130" heavy duty—with 12 roll backstand and layboy.
1—84" Hamblet with layboy and 2 deck 8 roll backstands for 30" rolls. Used 6 months.

SHREDDERS
2—24" Sprout Waldron heavy duty shredders—anti friction bearing equipped.
1—Rythor and Pringle Shredder.

SLITTERS AND WINDERS
1—100" Pusey & Jones Slitter and Rewinder

STUFF PUMPS
2—Beloit 10 x 20 triplex—with motors and chain drives.
1—Shartle 8 x 18 Triplex.
1—Shartle 7 x 16 Triplex.

SUCTION COUCH ROLLS
1—Millspaugh 22" diameter x 138¾" suction face.
1—Millspaugh 25" diameter x 170" suction face Roller Bearing.
1—Millspaugh 128" face x 14 9/16" dia.

SUCTION PRESS ROLLS
1—Beloit 107" drilled face x 22" dia.—anti friction bearings.

TRIMMERS
1—56" Undercut Trimmer.
1—63" Oswego.

TUBE WINDING MACHINES
1—120" Tube Winding Machines—4½" Mandrels—New.

VACUUM PUMPS
1—12 x 18 Connersville.
4—H-6 Nash—used 6 months.
1—L-3 Nash—used 6 months.
2—24 Nash Hytor.
1—#3 Nash Hytor.

VOITH INLET
1—112" Voith Inlet.
1—128" Bertram Inlet and Flow box.

WET MACHINES
2—Union Iron Works wet machines, cylinder mold 30" x 74"—Complete. No Vats
1—Union Iron Works—cylinder 30" dia. x 74" face.

FOR SALE

1—Brand new 62" Johnstone Score Cut Slitter and Rewinder with new motor equipment. For immediate delivery.
1—32" and one 36" Kidder Model SL, Shear Cut, Slitter and Rewinder. Reconditioned and guaranteed.
1—40" Paper Converting Machine Co. single-fold interfolding towel machine. Standard 10" x 10½" towels.
1—64" Hot Melt Coater, complete with Kidde electric oil heater, AC motor equipment and Reeves Drive.
1—Hudson-Sharp Co. "C" fold Towel Machine, for double towels 11x13".
1—94" Moore & White Duplex Rotary Sheeter.
Power Paper Cutters: 1—44" White; 4—Oswego, 50", 44", 38" and 34"; 1—32" and 1—42" Acme. 1—64" Seybold 20th Century; 1—68" Oswego Heavy Duty.
1—50" Pales Slitter and Rewinder, Model B. Equipped to slit 5/8" widths.
4—Glassine Bag Machines. Range 3x10" to 12x18".
3—High speed Paper Converting Machine Co.'s ¼" fold napkin folding machines, with embossing attachment, one also arranged for dispenser type napkins.
2—complete corrugating machines. One 60" Swift, "B" flute and one 62" Knowlton, "A" Flute. Also one S.&S. Rotary Slotter, 60"x130" and one 64" Langston Target Trip Knife.
1—Hudson-Sharp 72" single color, roll to roll, Aniline Printing Press, with double drum rewind and slitting attachment. Completely rebuilt.
1—#2 Appleton Jordan—⅜" bronze filling—direct connected to 150 h.p.—a.c.—450 r.p.m., 440 volt—3 phase—60 cycle Westinghouse synchronous motor.
2—New type Dilts Beaters, keyed bandless rolls, 66" x 60". Iron sides for concrete bottoms.
2—81" Dietz Perforators. For standard or facial toilet tissue, 4½x4¼" and 4½x5". Paper towels, 7½" and 13½".
2—#2 Emerson Jordans. Shell fillings, ⅛" steel. Plug fillings, 7/8" steel. Direct connected to 50 HP, AC Westinghouse motors.
1—62" Mayer Equalizer type waxing machine.
1—42" Cameron 9-5. Equipped with 50 new type Cameron score cut cutters and constant tension device.
1—30" wide Hudson-Sharp, No. FE-10 Embossing Machine.
1—60" Type "A" Langston Slitter and Rewinder.
3—Triple deck, 10" Hudson-Sharp Cocktail Size Napkin Folding and Embossing Machines. Can be equipped for 1/6 1/4 1/8 or any standard napkin fold. Brand new. Can be seen in operation near New York City.
1—34" Three Roll Friction Calender. Complete with 25 HP, AC motor equipment.
1—Erie Layboy, size 85" x 45".
1—81" Single Hamblet rotary sheet cutter with slitting attachment.
1—Electric power Elevating Platform Tiering machine.
1—40" Beck Razor Blade Slitter and Rewinder, complete with AC motor equipment.
1—40" Paper Converting Machinery Company's rotary type interfolding towel machine.
1—30" Waldron Embosser, with steel engraved and paper roll with the following patterns:—Alligator, spider, web, ribbing, moire and herringbone.
1—40" Tolhurst Centrifugal for suspended paper stock.
1—62" Kidder SH Slitter and Rewinder, equipped with Cameron score cut slitters. Rewinds to 40" diameter.

GIBBS-BROWER COMPANY, INC.
21 East 40th St., New York 16, N. Y. TF

FOR SALE

FOR SALE: STEAM DRIVEN COMPRESSOR
Laid Law Dunn Gordon—Horizontal
2 cyl. single stage Tandem 13/22 x 16 x 18. Compound Engine. Operate on 150# steam. Good condition.
Address Box 48-382 care Paper Trade Journal. J-1

FOR SALE

P & J Fourdrinier section. Wire 133" x 61' 2". Couch rolls. Breast roll. Wire rolls and Table rolls. Cone drive and shake.

Box #48-434 care Paper Trade Journal. J-15

FOR SALE

RUBBER ROLLS

1—13 11/16" Dia. x 62¼" Face, 72⅞" between shoulders, 4 1/16" Dia. Journals, 45 Density.
1—16 5/16" Dia. x 66⅜" Face, 73¾" between shoulders, 4⅞" Dia. Journals, .012 Crown x 12 Density.
1—15⅞" Dia. x 68¾" Face, 73⅞" between shoulders, 4 1/16" Dia. Journals, .014 Crown x 23 Density.

All in excellent condition.

STONITE ROLLS

1—16 11/16" Dia. x 66¼" Face, 73¾" between shoulders, 4 1/16" Dia. Journals.
1—14⅞" Dia. x 67¼" Face, 82⅝" between shoulders, 4 1/16" Dia. Journal. New cover —never used.
1—16 7/16" Dia. x 68¾" Face, 73¾" between shoulders, 4 1/16" Dia. Journals.

All in excellent condition.

For Prices Address Box 48-391 care Paper Trade Journal. J-1

FOR SALE

2 brand new 10" napkin folders completely equipped.

Address Box No. 48-414
care Paper Trade Journal
TF

FOR SALE: MOTOR DRIVEN COMPRESSOR
Ingersoll Rand—Two Stage Horizontal
20½ x 27—34 x 27 with Intercooler direct connected to Westinghouse 700 H.P., 2200 Volt, 3 ph, 60 Cycle. Synchronous Motor. Complete with exciter, starter and receiver.
Address Box 48-381 care Paper Trade Journal. J-1

SHEETERS FOR SALE

1—Black-Clawson 48" single knife. Rebuilt and Guaranteed

1—Hamblet — 48" single knife — Excellent Condition.

SUBURBAN MACHINE CO
3401 HARRISON AVE.
CINN., OHIO J-1

CURRENT OFFERINGS

45" and 58" Finley single knife Sheeters.
40" Waldron heavy duty 2-drum Slitter & Rewinder.
34" Comachine #6, now rebuilding. (Principals only).
32" and 34" shear cut Slitters.
39" C & P Automatic Power Cutter.
Model A Kelly Automatic.
Hoe 28x34 Rotary Metal Decorating Press.
NEW National 36" Hydraulic and 44" Auto. Power Cutters—prompt deliveries.
NEW Balers—Both Hand and Power.

THOMAS W. HALL COMPANY, Inc.
120 West 42nd St., New York 18
TF

FOR SALE

1—Combination Fourdrinier - Cylinder Machine Wire 121" x 61'5½". Suction Couch.
Three main presses
1 suction, 2 conventional
Smooth Press
21—5 ft. Dryers
2—Calenders
Reel and Winder
Back drives all enclosed type

SHARTLE BROS. MACHINE CO.
Middletown, Ohio J-1

MOORHEAD ELECTRICAL MACHINERY CO.

PITTSBURGH 19, PA.

M-G SETS—ROTARIES (3 ph. 60 cy.)

500 KW West. factory built M G Set, consisting of 500 KW 250 v. 900 RPM cpd. int. dir. con. common base 714 HP Syn. Motor .8 P.F. 2300 v. with manual starting panel including magnetic excitation relays, also standard DC Panel. Good condition. Immediate shipment.
90 KW West. 60 v.—220/440 v.
75 KW West. 75 v.—220/440 v.
300 KW 125/250 v. West.—450 HP 35% L.P.F.
50 KW 125 v. G.E.—75 HP G.E. 2200 v.
40 KW West. SK 250 v.—60 HP G.E. KT 220/40.
15 KW Wotten 125 v.—25 HP Wotten 220
10 KW Bardco 125 v.—15 HP Master 220/440
2-7½ KW West. 35 v. DC—15 HP West. SK 230 v.
7½ KW West. 250 v. 1750 RPM—15 HP West CS 220/440.

A.C. & D.C. GENERATORS

1000 amp. 60 volt Westgh. SK Welding Gen.
2—150 KW West. SK 125 v. 1200 RPM.
300 KW West. SK 250 v. 1200 RPM.
125 KVA 220/3/60 277 RPM West.

AIR COMPRESSORS

1100 cu. ft. 100# lbs. Chg. Pneu. 2 stage, 19" & 11" x 12" with intercooler, aftercooler, unloader, air receiver dir. con. 215 HP West. Syn. Motor 2200 v. 3 ph. 60 cy. 257 RPM with belted 8 KW SK West. exciter and manually operated starting panel. Good condition. Immediate shipment.
755 CFM Chic. Pneu. two stage Belted.
245 cu. ft. Ing. Rand belted ER1
355 cfm 100# Chic. Pneu. 12 x 10 Belted.
270 cfm 100# Chg. Pne. Gas. Portable.
220 cfm 100# Ing. Rd. Gas. Portable.
175 cu. ft. 100# pres. Chic. Pneu. 9x8.
1—164 cu. ft. Ch. Pneu. Steam Type.

REDUCTION UNITS

500/700 HP Morse Chain Drive—4.28 to 1.
150 HP Nuttall 1.6 to 1.
150 HP G.E. Unit ratio 3 to 1.

ENGINE & TURBINE UNITS

50 KW West.—Turbo 125 v.
500 KW 250 v. G.E.—Terry mixed pres.
2—400 KW G.E. 250 v.—Skinner Steam Engines.
2—1250 KW .8 P.F. 2400/3/60 G.E. Curtis.
2500 KVA GE 2300/3/60 3600 RPM
5—75 KVA 110/220/440 v. G.E. Diesels.

AC MOTORS (3 ph. 60 cy.)

HP	Make	Wdg.	Spd.	Type
500	Elec. Mcry.	Syn.	120	
450	G.E.	S.R.	257	I M
300	G.E.	S.R	450	I M
300	G.E. 25 cy.	S.R.	375	MT415
300	West	Sl. rg.	1750	CW
300	West.	S.R.	600	CW
250	Al. Ch.	S.R.	600	ANY
150	G.E.	Syn.	600	ATI
150	G.E.	Syn.	720	TS
150	G.E.	S.C.	450	IK
125	West.	Syn.	277	
100	G.E.	S.R.	450	IM
80	G.E.	S.R.	900	MTC
75	A.C.	S.C.	865	
75	G.E.	S.R.	600	I M
75	West.	S.C.	690	CS
75	G.E.	S.R.	575	ITC
75	West.	S.C.	450/900	CS
50	G. E.	S.R	860	I M
50	G.E.	S.C.	865	I K
50	G.E.	Sl. rg.	900	I-M
50	West.	S.R.	585	CW658D
50	A.C.	S.C.	1750	
25	C.Wh.	S.C.	600	SC504
25	500 v. West.	S.C.	1750	CS365
25	Cr.Wh.	S.C.	865	
25	Cr.Wh.	S.R.	580	1210
15	L.A.	S.C.	3600	Fr.324
10	West.	S.C.	570	CS566C
10	West.	S.C.	870	CS464C
10(6)	West.	S.C.	1200	CS370C
7½	West.	S.C.	870	CS
7½	West.	S.C.	3440	CS254Y
7½	U.S.	S.C.	1750	284
5	West.	S.C.	1750	254
5(2)	West.	S.C.	1200	CS

D. C. MOTORS

HP	Make	Voltage	Wdg.	Speed
375	West.	230	sh.	430/860
200	G.E.	550	cp.	875
125	West. S.K.	230	sh.	400/1200
60	Rel.	230	cp.	800/1200
50	G.E.	230	sh.	250/1000
50	Northern	230	ser.	600
50	Rel. 185T	230	sh.	1800
50	West. SK	230	sh.	1750
40	G.E. (Vert.)	230	cp.	1750
40	Roth 126 RS	230	cp.	1700
40	W.E.	230	cp.	750
40	G.E. CD	230	sh.	1750
30	West. SK93	230	sh.	1750
20	Cr.Wh.	230	sh.	1150/1750
20	West. SK	230	cp.	1750
15	West. SK93	230	sh.	825
15	West. S5	230	cp.	1000
15(4)	Cr. Wh.	230	sh.	1400/1700
15	West.	230	cp.	750
13	West. SK113	230 Enc.	cp.	850
10	West. SK63	230	sh.	1150
10	G.E.	230	cp.	1750
10	G.E.	230	sh.	1150
10	West. S.K.	230	sh.	730/1460
7½(2)	Al.-Ch.	230	sh.	350/1050

NEW DC MAGNETIC MOTOR STARTERS

3-10 HP 230 V. with dynamic braking.
1-25 HP 230 V. C-H Dripproof.
1-50 HP 230 V. C.H. Dripproof
3-40 HP 230 V. C.H. Dripproof.
5-60 HP 230 V. C.H. Dripproof
5-60 HP 230 V. W. Leonard Dripproof
4-60 HP 115 V. W. Leonard Dripproof.
5-75 HP 230 V. C.H. Dripproof
1-100 HP 230 V. C.H. Dripproof.
150 HP Cutler Hammer 230 V. Mag. Control.

AC MAGNETIC STARTERS (3 ph. 60 cy.)

2—700 HP West. 2300 v. Syn. Line Starters.

Electrical Engineers—Specializing in *Rebuilt Electrical Machinery* for over a Quarter of a Century

FOR SALE

Paper Power Cutters; Slitters & Rewinders; Die Cutters; Printers; Scorers & Creasers; Gluers & Wrappers; Coaters; Laminators; Waxers; Stitchers; Brightwoods.

Write for latest bulletin listing available paper box & paper converting machinery. Get on our permanent mailing list for up-to-date inventory.

SOUTH WABASH ENGINEERING CO.
2929 So. Wabash Ave.
Chicago 16, Ill.
TF

FOR SALE—Machine for Die Cutting and Folding Toilet Seat Covers, also Toilet Roll Perforators. Both machines in new condition. For particulars, address Box 48-397 care Paper Trade Journal. TF

WANTED

WANTED TO BUY:

60" Laminator. Must be in good condition. Submit full particulars and photograph or descriptive matter in letter addressed to Box No. 48-417 care Paper Trade Journal.
J-8

WANTED

WANTED

Titaniums—Lithopone
Alkalies—Waxes—Solvents
Colors—Oils—Residues, etc.
Chemical Service Corporation
86A Beaver St., New York 5, N. Y.
J-17

WANTED TO PURCHASE OR LEASE, one rewinder, 62" to 80", capable of winding 40" diameter roll of coated book paper. Address Box 48-427 care Paper Trade Journal.

FOR SALE

1—20" Experimental Wet Machine
1—Mould 60 x 84"
1—150" Fourdrinier with Voith Inlet, 80 ft. wire, 22" suction couch, anti friction
1—104" Fourdrinier, 60 ft. wire, 22" suction couch
1—123" Bagley and Sewall uniform speed reel
3—Sets press rolls 18" x 116"
1—80" Kidder slitter, new 1940
1—78" Hamblet cutter with layboy and ten roll backstand
1—110" Fourdrinier with three sets Rice Barton presses, rolls 20" x 108"
1—18" x 150" suction couch roll
1—22" x 130" suction couch roll
1—55" Holyoke supercalender, nine roll, with pneumatic loading and Vickery doctors, Timken bearings
1—82" Norwood nine roll supercalender
1—Ohio hay baler
1—Weiner refiner, anti friction
1—130" two bowl Pusey and Jones reel
1—150" two bowl Pusey and Jones reel
1—130" two drum Pusey and Jones winder
1—154" Warren Winder
2—Almost new rotary Ransom agitators 9 ft. x 11 ft. x 6 ft. long, Timken equipped
1—7 x 16 and one 10 x 20 Shartle duplex stuff pump
2—Emerson Junior No. 2 Jordans, almost new
2—Moore and White rotary screens, stainless steel, plates cut .012"
2—Perkins rag cutters, very good
1—30" Fales slitter
1—56" No. 6 Cameron slitter
1—New twelve plate Packer roller shoe screen with plates and scraper
4—New Packer vats for ten plate flat screens
1—Experimental size Williams patent pulverizer
1—18" Experimental wet machine

FRANK H. DAVIS CO., 175 Richdale Ave., Cambridge, Massachusetts TF

WANTED

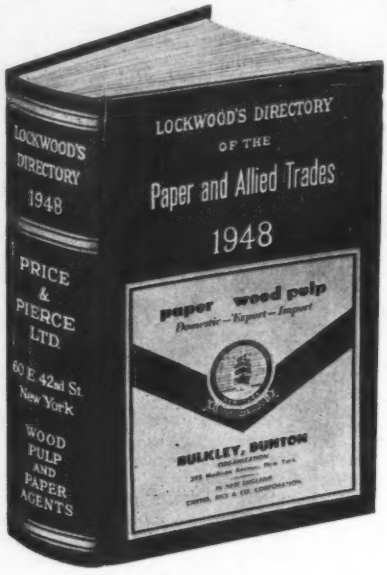
WANTED—W & P Shredders, Evaporators, Generators and Boilers, Slitters, Cutters, Hydraulic Presses, Sheridan Presses, Dryers. Address Box 48-223 care Paper Trade Journal. TF

WANTED

PAPER MANUFACTURER desires to purchase or invest in converting business of standard paper products. Address Box 48-222 care Paper Trade Journal. TF

WANTED

WANTED—Brightwood Box Machine. Address Box 48-224 care Paper Trade Journal. TF



THE SEVENTY-THIRD EDITION

Lockwood's Directory

OF THE

Paper and Allied Trades

The Guide to the Paper and Allied Industries

Issued Annually Since 1873

Regular Edition or Traveler's Edition
$10.00 or $9.00—cash with order

CONTENTS

PAPER AND PULP MILL SECTION

Geographically arranged by states

Reports of the paper, ground wood pulp and chemical fiber mills located in the United States and Canada.

These reports include name of company. Location of mill. Names of officers and operating executives.

It is indicated whether the plant is a paper mill, ground wood mill, sulphite, sulphate, or a soda pulp mill.

Type of mill equipment. Kind of power used, whether water, steam or electricity.

Shipping point, Railroad siding, Post Office, nearest Bank, Money Order, Telegraph Office, Telephone Number, U. S. and State Route Numbers. Canada: Kings and Provincial Highway Route Numbers. Population.

KIND OF PULP AND PAPER manufactured. Total production in pounds per 24 hours.

MILL OFFICIALS—Alphabetical list of 4831 mill officials and executives including their connections.

Reports of the Paper and Pulp Mills in Cuba, Mexico, Philippine Islands, Puerto Rico, and South America.

Glazed, Coated Paper and Board Manufacturers.

List of idle mills in the United States and Canada.

ADDITIONAL MILL INFORMATION

PAPER AND PULP MILL OFFICES in a few of the leading cities in the United States and Canada. 555 in this list.

MILL PRODUCTS—Arranged in alphabetical order. 375 different classifications of products made.

RAW MATERIALS—Classified and arranged in alphabetic order. The kind and grade of paper stock and rags consumed by the different mills including names of the purchasing agents.

PAPER AND PULP MILL MACHINERY, EQUIPMENT AND SUPPLIES—A classified (alphabetical) list of 1467 different kinds of machinery, equipment and supplies used in the pulp and paper mills including the names and addresses of 1542 manufacturers.

CONVERTERS' SECTION

Manufacturers of Paper Specialties

1479 Manufacturers . . . 673 Classifications of Products Made
A classified list (alphabetically arranged) of products made from paper, cardboard, etc., such as drinking cups, mailing tubes, napkins, toilet paper, towels, wrapping specialties, etc. The name and address of the manufacturer is included.

Separate Lists of Concerns

(Geographically arranged) manufacturing the following products:

ENVELOPES—249 Concerns manufacturing commercial envelopes. Only concerns operating machines are included.
PAPER BOXES—1498 Manufacturers keyed to show whether stiff, folding or corrugated boxes are made, also whether suit, millinery, confectionery, etc., etc.
PAPER BAGS—254 Manufacturers of paper bags and sacks.
PAPETERIES—109 Selected manufacturers of papeteries.
PREPARED ROOFING—43 Manufacturers.
TABLETS AND PADS—162 Manufacturers keyed to show those engaged in other lines.
TAGS—65 Selected manufacturers.
TWINE—132 Manufacturers of twine from cotton, jute, hemp, etc.
VEGETABLE PARCHMENT—7 Manufacturers of genuine vegetable parchment.
WALL PAPER—58 Selected wall paper printers.
WAXED PAPER—114 Manufacturers.

ADDITIONAL SECTIONS

PAPER DEALERS—2966 Paper Merchants, geographically arranged and keyed to show the * General Paper Dealers who Maintain Stores. † Member National Paper Trade Association. s Dealers who sell from Storage, Warehouse or from Mill direct. sl Merchants in other lines who carry paper as a side line. b Brokers. br Concerns that are Branches of Houses located elsewhere. f Fine Paper. w Wrapping Paper. f.w. Fine and Wrapping Papers.

RAGS AND PAPER STOCK—757 Dealers in rags and paper stock who sell raw materials to the paper mills.

WATERMARKS AND BRANDS—Approximately 15,000 watermarks and brands used in the American paper trade—alphabetically arranged. Names of owners are included. This list is restricted to papers of various kinds—converted products are not included.

ASSOCIATIONS—Reports of 156 Trade Associations in the paper and allied industries with names of officers.

PULP TESTING CHEMISTS—WOOD PULP IMPORTERS—STATISTICAL INFORMATION

LOCKWOOD TRADE JOURNAL COMPANY, INC.

15 W. 47th ST. **NEW YORK 19, N. Y.**

One of a series of messages to help you increase your understanding of business paper advertising, and its effect on your job.

Why you have a big stake in your company's advertising

NO MATTER WHAT your present job may be, your chances of getting ahead depend on your company's ability to make a fair profit.

As a production man, you have a pretty good idea of how profits are earned. You know that without modern, high-speed production tools, there wouldn't *be* any profits — or any jobs, for that matter. Your cost-per-unit would be so high that you couldn't compete with other manufacturers in your market.

The same thing applies to the *manufacture of a sale!* Without mechanization, the cost of "manufacturing" would be prohibitive.

That's where advertising comes into the picture. Because advertising is simply the assembly-line technique in selling. Just consider the five basic operations involved —

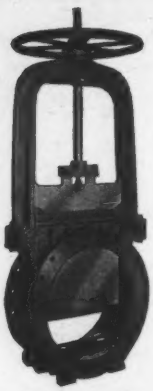
1. **Seeking out prospects**
2. **Arousing their interest**
3. **Creating a preference for your product**
4. **Making a specific proposal**
5. **Closing the order**

Advertising performs the first three of these jobs. And it performs them *far more economically* than any other means, leaving your salesmen free to concentrate on the two that they alone can do, and do best. In that way, advertising increases your company's chance to earn a profit. And that is why you have a big stake in its *efficient use.*

Where can your company's advertising work at its highest efficiency? Where but in those business papers which are concentrated among your company's best prospects — *and no one else!*

PAPER TRADE JOURNAL

is a member of The Associated Business Papers, who have published an interesting folder entitled, "10 ways to measure advertising effectiveness." We'll be glad to send you a copy. And if you'd like reprints of this advertisement (or the entire series) to pass along to others in your organization, just say the word.



RECORD PAPER & PULP STOCK VALVES "BONNETLESS SELF CLEARING" - - - "RESIDUE POCKETLESS TYPE"

METALS — I.B.B.M., all iron, bronze or stainless steels, body parts plain or rubber lined.

The photo of 24" Fig. 241 I. B. B. M. valve while illustrating the gate bottom wedge system for forced gate seating and "GUILLOTINE" edge for shearing fibre at seat also shows the packing box and yoke as separate units. Both adjustable.

- The "FAST THREADED" screw stem and ball bearing speeds valve operation.
- The packing box is extra deep, is adjustable and provided with specialized lubricated packings and special type gland and compression bolts.
- The yoke mountings are such that yokes for various methods of gate operation are interchangeable.
- Replaceable gate edge shoes are used in valves 10" and larger. These shoes are of special value when valves are installed stem and pipe horizontal.

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SYMBOL OF FINE CRAFTSMANSHIP

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Paper pick-up after Oakite descaling is uniformly good because there's no etching action . . . no brightening of wire. Oakite Compound No. 32, fast-acting inhibited acid, soaks off the scale and leaves wire dull, DULL! For full, free details write TODAY! No obligation.

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Norton Co.
Raybestos-Manhattan Inc., Manhattan Rubber Division

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Hercules Powder Co.
Monsanto Chemical Co.
Nopco Chemical Co.
Philadelphia Quartz Co.

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The Biggs Boiler Works Co.
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Dorr Company
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Hardinge Company, Inc.
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Valley Iron Works Co.
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Shartle Brothers Machine Co.

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Pittsburgh Plate Glass Co., Columbia Chemical Division
Reichhold Chemicals, Inc.
Rohm & Haas Co.
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Witco Chemical Co.
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D. J. Murray Mfg. Co.
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Moore & White Co.
Potdevin Machine Co.
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Weber, Herman G., & Co., Inc.

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The Brown Instrument Co.
Cochrane Corp.

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Link Belt Company
Moore & White Co.
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Shartle Brothers Machine Co.
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Waldron Corp., John
T. B. Wood's Sons Company

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Taylor Stiles & Co.

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DAMPENERS
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Raybestos-Manhattan Inc., Manhattan Rubber Division
Valley Iron Works Co.

DANDY ROLLS
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DE-INKING
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Dilts Machine Works
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Nopco Chemical Co.
Philadelphia Quartz Co.
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Nopco Chemical Co.

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Lukenweld
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Downingtown Mfg. Co.
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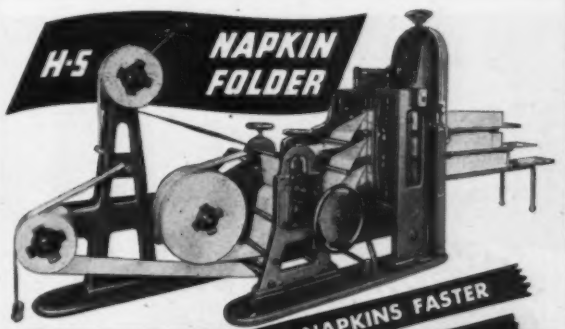

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MORE and better napkins with our post-war No. 2-A folder. Makes all folds — quarter fold, eighth fold, sixteenth fold and dispenser fold — on one machine. This unusual versatility, plus our usual quality, makes this multiple duty folder an important addition to your production department. Write for information.

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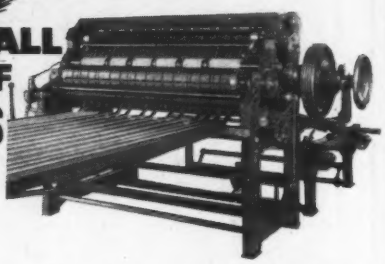
FOR ALL TYPES OF FOLDS



Illustrated here is the 62" folder for making multifold single or two-ply towels . . . receiving table is arranged longer than standard to fit requirements in the finishing room . . . machine shown is arranged for 12" length multifold towels . . . equipped with slip type clutch for easy starting . . . automatically counts and marks the stock as delivered onto the receiving table.

This machine embodies the rotary principle patented by us for later-folding paper.

Machines of the same general construction have been made for other length multifold towels, such as 9½", 10", 10½", 15" and 15½". If other sizes are desired, they can be furnished.

Write for complete information.

SIMPLICITY THE KEYNOTE OF OUR MACHINE DESIGN

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Why experiment in tank construction when this proved, practical and dependable type of construction is now available?

The material that is enduring, clean and adaptable to any size or shape.

Consult Kalamazoo engineers for planning any type of tank or chest.

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Link Belt Company
Moore & White Co.
Murray, D. J., Mfg. Co.
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J. J. Ross Company
Ross Paper Machy. Corp.
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Shartle Brothers Machine Co.
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T. B. Wood's Sons Co.
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E. D. Jones & Son Co.
Moore & White Co.
D. J. Murray Mfg. Co.
John Waldron Corp.

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Ciba Company
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Geigy Co., The
General Dyestuffs Corp.
National Aniline Division, Allied Chemical & Dye Corp.
C. K. Williams & Co.
Witco Chemical Co.

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Roehlen Engraving Works
John Waldron Corp.

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Rohm & Haas Co.

ENZYMES
Rohm & Haas Co.

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Swenson Evaporator Co., Div. of Whiting Corp.

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Ross Engineering Co., J. O.

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Leeds & Northrup
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Orr Felt & Blanket Co.
Shuler & Benninghofen
Waterbury Felt Co.
Waterbury, H., & Sons Co.
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The Cowles Detergent Company
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Shartle Brothers Machine Co.
Waldron Corp., John

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Link Belt Company
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Suburban Machine Co.
Valley Iron Works Co.
Waldron Corp., John
Westinghouse Electric Corp.

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Farrel-Birmingham Co.
Gibbs-Brower Company, Inc.
Lobdell Co.
Norton Company
Samuel C. Rogers and Company
The Sandy Hill Iron & Brass Works

TO BUY

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Norton Company

GUIDES, WEB
Mount Hope Machinery Co.
Bound Brook Engrg. Co.

GUMS
Stein-Hall Co., Inc.

HEADS
Babcock & Wilcox Co.
Lukens Steel Company

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Westinghouse Electric Corp.

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General Electric Co.
Leeds & Northrup
Minneapolis-Honeywell Regulator Co.
D. J. Murray Mfg. Co.
Ross Engineering Corp., J. O.
Stickle Steam Specialties Co.
Valley Iron Works Co.
Westinghouse Electric Corp.

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Rodney Hunt Machine Co.
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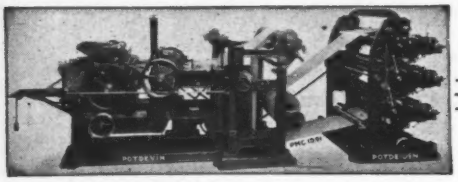

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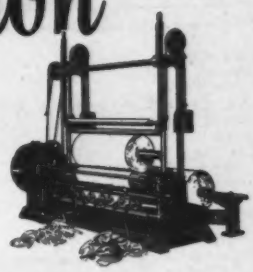

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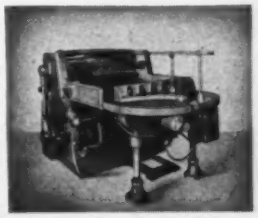

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TABLE VI.—CONDITIONS OF PYROLYSIS AND RESULTS, USING APPARATUS V *

Experiment Number	Time, hours	N Recovered, %	N in Residue, %	N Not Accounted For, %
45	7	13	1	86
46	7	23	11	66
47	0.4	31	0	69
48	0.4	18	0	82
49	0.4	45	0	55
50	0.75	36	0	64
51	0.7	52	0	48

* SWL III in granular form used throughout, with humid air flowing through the retort. The apparatus was used as a gas producer in expts. 45-46. The SWL solids were dropped on a hot coke bed in expts. 47-49, and on a hot quartz bed in expts. 50-51.

TABLE VII.—RECOVERY OF NITROGEN AND SULPHUR AFTER VARIOUS PERIODS OF PYROLYSIS

Time of Pyrolysis, hours	Experiment 17	Experiment 44	
	Nitrogen Recovered, cumulative %	Nitrogen Recovered, cumulative %	Sulphur Recovered, cumulative %
0.08	...	43.2	38.5
0.16	...	46.4	40.5
0.33	...	49.5	42.3
1.00	34.0	56.4	45.0
2.00	34.7	60.2	47.5
2.50	...	61.0	48.0
3.00	36.0	...	...
Toal	36.0	61.0	48.0

However, in these latter experiments other factors as well may have contributed to the higher recovery, e.g. the confinement of the sample which prevented it from being blown out of the retort.

That rapid heating is not a necessity in the recovery is shown by the results of experiments 7 to 10, undertaken later, which gave moderately satisfactory yields of ammonia. In these experiments, the solids were heated to the final temperature over a period of 2 hours. Rapid heating expedites the process and may result in improved recovery, but high recovery can be obtained without it.

Apparatus IV was constructed to permit the use of larger samples and also of liquid samples. The results obtained by its use confirm the necessity of a high temperature. They also show that concentrated sulphite waste liquor can be put directly in the retort with results equal to those obtained by the use of solids.

In Fig. 2 the ammonia recovery, in each experiment using humidified gas, is plotted against the temperature of prolysis. The general correlation is evident.

The course of the ammonia liberation with time was followed in experiment 44 (Table VII).

Here again it is shown that the major portion of the total ammonia yield was liberated almost as soon as the solids were brought to pyrolysis temperature. (In this experiment a substantial amount of gas escaped through the sample tube and air inlet tube.)

The course of the sulphur liberation was also followed in this experiment, and results are given in Table VII. The values recorded are those of total sulphur.

Apparatus V was built to make possible the pyrolysis of larger samples and to investigate several methods of operation that might be adaptable to large scale application. Operation of this apparatus as a gas producer resulted in the destruction of most of the nitrogen. When the solids were dropped on a bed of incandescent coke (expts. 47-49), the recovery was somewhat better. Dropping the solids on lumps of quartz heated by gas (expts. 50-41) resulted in a yield slightly better but still unsatisfactory. The recovery in these latter experiments was complicated by the impossibility of maintaining high temperature and high humidity simultaneously in the sulphite waste liquor solids. The active combustion evidently burned most of the ammonia.

The gas resulting from the pyrolysis thus contains ammonia but it also has potential value as a fuel, and as a source of sulphur for reuse in the sulphite pulping process. The fuel value has not been determined but on numerous occasions it has been observed that the gas is readily combustible. The sulphur content of the gas has already been indicated in Table VII, but the different forms of sulphur have not been determined separately. Hydrogen sulphide was usually present, as manifested by its odor and by means of lead acetate test paper. Sulphur dioxide also was probably present. These two compounds could be expected to react in aqueous solution to produce elementary sulphur and perhaps other sulphur compounds. Almost invariably a white colloid, evidently free sulphur, appeared in the absorbent. There was usually an excess of hydrogen sulphide, and probably no sulphur dioxide was ordinarily present in the absorbent. Thus as it is recovered, the sulphur does not appear to be amenable to direct reuse in the sulphite pulping process.

From the experimental results obtained and from information found in the literature on the decomposition of ammonium benzene sulphonate, it seems probable that the most rapid reaction of ammonium sulphite waste liquor solids when heated to a high temperature is simple splitting of the salt to free ammonia and other volatile products. Simultaneously there is some dehydration to form sulphonamide and other nitrogen compounds. These side reactions predominate at low temperature and are favored by slow heating. The nitrogen in such compounds is still recoverable as ammonia, but only by prolonged heating in a humid atmosphere. From the fact that the solid products of the pyrolysis almost always contain a higher percentage of nitrogen than the raw feed, it must be concluded that the solids as a whole are volatilized by the water gas reaction at least as fast as the nitrogen. Perhaps reduction of the sulphur to mercaptide is an essential step in the pyrolysis, as a result of which ammonia is liberated simultaneously with the reduction or immediately thereafter.

Conclusions

Ammonium sulphite waste liquor solids can be pyrolyzed to yield ammonia equivalent to about 90% or more of the nitrogen originally present in the solids. A temperature of about 600°C or more is necessary to complete the pyrolysis in a reasonable time. Satisfactory recovery can be achieved only by nearly complete gasification of the solids. The gas is combustible but of unknown heating value. The atmosphere around the solids during pyroylsis must be humidified. When the waste liquor is fed as concentrated solution to the pyrolysis retort, the yield of ammonia is about equal to the yield obtained by the use of dried solids. Rapid heating of the solids is desirable since it evidently results in more rapid pyrolysis, but it is not necessary. Although a considerable part of the sulphur is recoverable by the pyrolysis, it is in a form which is not readily available for reuse.

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